

The Dynamic Relationships between Trading Volume, Stock Returns, and Volatility: Evidence from Amman Stock Exchange

العلاقات الديناميكية بين حجم التداول وعوائد الأسهم وتقلباتها: دليل من بورصة عمان للأوراق المالية

The Dynamic Relationships between Trading Volume, Stock Returns, and Volatility: Evidence from Amman Stock Exchange

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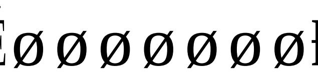
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تاريخ مناقشة الأطروحة

٢٠١٣/١/١٣ م



بسم الله الرحمن الرحيم

"قل إعملوا فسيرى الله عملكم ورسوله والمؤمنون"

(صدق الله العظيم)

إلى من كلله الله بالهيبة والوقار .. إلى من علمني العطاء بدون انتظار .. إلى من أحمل أسمه بكل افتخار .. أرجو من الله أن يمد في عمرك لترى ثماراً قد حان قطافها بعد طول انتظار وستبقى كلماتك نجوم أهتدي بها اليوم وفي الغد وإلى الأبد.. والدي العزيز

إلى ملاكي في الحياة .. إلى معنى الحب وإلى معنى الحنان والتفاني .. إلى بسمة الحياة وسر الوجود إلى من كان دعائها سر نجاحي وحنانها بلسم جراحي إلى أغلى الحبايب ... أمي الحبيبة

بكل الحب.. إلى رفيقة دربي إلى من سارت معي نحو الحلم.. خطوة بخطوة بذرناه معاً.. وحصدناه معاً وسنبقى معاً.. بإذن الله .. ..زوجتي الغالية....

إلى اغلي ما في الوجود ... ريحانتي التي تفوح عطراً ابني ....محمد....

إلى القلوب الطاهرة الرقيقة والنفوس البريئة إلى رياحين حياتي ....إخواني وأخواتي.........

إلى الأخوة اللذين لم تلدهم أمي .. إلى من تحلو بالإخاء وتميزوا بالوفاء والعطاء إلى ينابيع الصدق الصافي ...
أصدقائي

الباحث

خالد الدويري

ﻝ ƑĭǊƗΘǄǁ ƼǄǮƑƽ

ƼΘƸƬǁ	ƠǊøøøøøƮǊǄǁ
ƒ	ƃƐƣǉǛ
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Čč	ƥƑƒĂƶ!ƒ Ɣǁƙ đ-Ď

đĐ	Dĭnj႞Ǖƒ þƑƒĂƵĂ ýĂƒþƙ!ƒ Dĭɳơ LJŏħ Ƚŏǂŏďžƈǉŏþ!ƒ Ƚpǚz!ƒ-Č
đĐ	Ŏ!Ɠơ!ƒ DĭĂŏ!ƒ ýĂƒþƙ!ƒ DĭɳơĂ LJŏďžĂŏ ýħp Ɠďž! ýĂƒþƙ Dĭɳơ LJŏħ Ƚŏǂŏďžƈǉŏþ!ƒ Ƚpǚz!ƒ -D
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đē	LJŏďžĂŏ ýħp Ɠďž Dĭnj႞D þƑƒĂƵĂ Ŏ!Ɠơ!ƒ DĭĂŏ!ƒ Dĭnj႞D þƑƒĂƵ LJŏħ Ƚŏǂŏďžƈǉŏþ!ƒ Ƚpǚz!ƒ -þ
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ĒĐ	ýhp Ǵdž! Ďnjdž٦Ɒ ƥƑƒĂƵ ƘǴhǚǀƙĂ Ŏ!Ǵơ!ƒ ĎžĂŏ!ƒ Ďnj٦Ɒ ƘǴhǚǀƙ ǇĴŏh Ɨŏǂŏdžǵǉŏƥ!ƒ Ɨpǚ̆z!ƒ -Ɵ ǇŏdžĂŏ
ēċ	ǀƒĭƬǋǂǁƐǋ ƛəƑƗǆǁ : Ƨ ơƑƨǁ üƬƻǁ
ēČ	ǋƑǴǩǈ!ƒ č-Ē
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ēĎ	ƘǴ̂ŏƮĂƙ!ƒ ď-Ē
ēď	ƴƞƒƧdž!ƒ
ēĔ	ƗŏƨŏǚƞǈǗƒ Ɨʓǚ!Ǵh ƒ Ƥǚdž!ƒ

üǸǫǭǁ ƶƊǍǝƑ5

ƶƟƨƬǁ	üǸǫǭǁ ǅƸǸǰƳ	üǸǫǭǁ !5ƥ
ĎĐ	ƗǀƞǴƪ!ƒ ƘǴƪƒƧƥ!ƒ ƒ Ƥǁǆ	č-ď
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Đċ	ǅǌƪŰƒ ƥƑƒĂƵĂ ýĂƒƥƙ!ƒ ǅƞơ ǈǒƞ ǁƧƙƬǆ!ƒ ýǆǴƚƙ!ƒ ƧǴƙƤƒ	Ď-đ
ĐĎ	ǅǌƪŰƒ ƥƑƒĂƵ ƘǴƞǁǀƙĂ ýĂƒƥƙ!ƒ ǅƞơ ǈǒƞ ǁƧƙƬǆ!ƒ ýǆǴƚƙ!ƒ ƧǴƙƤƒ	ď-đ
Đē	ǅǌƪŰƒ ƥƑƒĂƵĂ ýĂƒƥƙ!ƒ ǅƞơ ǈǒƞ ƗǒƞƞƪǕƒ Ɨpŭƶ!ƒ	Đ-đ
đč	ǅǌƪŰƒ ƥƑƒĂƵ ƘǴƞǁǀƙĂ ýĂƒƥƙ!ƒ ǅƞơ ǈǒƞ ƗǒƞƞƪǕƒ Ɨpŭƶ!ƒ	đ-đ
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ʅ ƹƥ Tƚƣǆƀ ƶǆǝƒƽ

ƥƒTƚƣǕƹ üǊƀƣǆ	Ʀǆƥƀƹ
Mixture of Distribution Hypothesis.	MDH
Sequential Arrival of Information Hypothesis.	SAIH
Vector Autoregression Model.	VAR
Generalized Autoregressive Conditional Heteroskedasticity.	GARCH
AutoRegressive Conditional Heteroskedasticity.	ARCH
Integrated Generalized Autoregressive Conditional Heteroskedasticity.	IGARCH
Exponential Generalized Autoregressive Conditional Heteroskedasticity.	EGARCH
The GARCH-in-mean.	GARCH-M
The Threshold GARCH.	TGARCH
.Mean Absolute Percentage Error	MAPE
.Mean Absolute Error	MAE
Diebold and Mariano Test.	MD
National Stock Exchange.	NSE
Dow Jones Industrial Average.	DJIA
Arab Monetary Fund.	AMF
Deutsche Borse Ag German Stock Index	DAX

(Johnson Cointegration test)

(Granger Causality test)

(Vector Error Correction Model)

(VEC)

üNjŬɛ üƬƻǁɛ

ƕƨɛƥƣǂǁ !ƑyⁿǁƐ ƥƑƯŰɛ

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(Cointegration Johansen test)

(Granger Causality test)

(VEC) (Vector Error Correction Model)

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.(www.tdwl.net)

(Liquidity ... Campbell et,al (1993)

(Noninformitional Traders) ... Traders)

(Risk-Averse Utility Maxmizers)

(Noninformitional ... Traders)

.(Market Makers)

Campbell et,al (1993)

.(Noninformational Traders)

(Market Makers)

(Noninformational)

(Heterogeneous Investors)

(Noninformational)

Campbell et,al (1993)

Nishat and Mustafa (2008)

.(www.ahmednasr.net)

[illegible]

[illegible] (Morse, [illegible]) [illegible]

[illegible] (Standard Deviation) [illegible]

[illegible] (Variance)

[illegible]

[illegible] (www.alqabas.com)

(P/E)

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. (www.investopedia.com)

.Mahajan (2008)

(Mixture of Distribution Hypothesis)

.Clark (1973) (MDH)

Luu and Martens (2002)

(MDH)

(MDH) (Luu and Martens)

Andersen et, al. (2000)

(MDH)

((Luu and Martens

(MDH)

(Sequential Arrival of Information

.Copeland (1976) (SAIH) (Hypothesis

Mahajan and Singh (2008)

De Long et, al. (1990) (Noise Trading) ǸƵƨǆ!ƒ ýǆĞƶķǆ!ƒ ꟾŖĂǆǉ ď-Ē-Ď

ÜŧŏþĜƬķƿƒ ΣƪƉ ĬǁƵ þǉķƪķ Ŭ ČĜưĂư!ƒ ƧĜɳķ ƘĜƱĜƬǉ ǇƉ ŧŏƧƱǉ!ƒ ǉŘǋ ƯƧķƽķĂ

ǉŘǋĂ ÜƧŏƬ!!ƒ ăþǆ!ƒ ĬǁƵ Ǆǌƪǖƒ ƧĜƶƪƉ Ŏ5 ŧķpƋǆ ƧŏƶƪķČĂƪ ŧ!Ĝơ ŧĂþơ Ĭ!ǫ ĭþƋŏ Ĝǆǆ

Ǆǌƪǖƒ þƑƒĂƵ ƱƪĂķǆ Ŏ5 ýɳƒƧķ ĜǌǉƵ ĜƬǉŏ Ă ýŏĂƱ!ƒ ăþǆ!ƒ ĬǁƵ ŎƽķƤķ ŧŏơ ŧķpƋǆ ŧŏ!Ĝơ!ƒ

.(ĎČČĔ ǇĂƧƤcĂ ĭþŏǈƨ!ƒ) ýĂƒþķ!ƒ ǄĜɳơƉ Ŏ5 ƧŏʒķŎ!Ĝķ!ĜǈĂ

ýĂƒþķ!ƒ Ǆɳơ Ĭ!ǫ Ǆǌƪǖƒ þƑƒĂƵ ǇǆǊɳķķ ŧŏǈĜɳŏŬƒ ŧŏǈǈƪ!ƒ ŧpǘƶ!ƒ ꟾŖĂǆǉ!ƒ ƒŘǋ Ŏ5Ă

ĬǁƵ ǄǌķƒƧƒƧp þǉķƪķ Ŏķ!ƒ ČĜưĂư!ƒ ƧĜɳķ! ŧŏǈĜɳŏŬƒ ǀƧĜɳķ!ƒ ýƶ5 þĂþƧ yǆ ƽƪķķ ŎǋĂ

Ĭ!ǫ ýĂƒþķ!ƒ Ǆɳơ ǇǆǊɳķķ ŧŏǈǈƪ ŧŏǈĜɳŏƒ ŧpǘƵ ĜưŏƉ ǁĜǉǋĂ ÜŧǀǈĜƪ!ƒ ƧĜƶƪǖƒ Ƙĝ‡Ƨơķ

Ƙǘǆƶķ! ŧɳŏķǉ Ŏǋ ƧĜƶƪǖƒ Ŏ5 ƘƒƧŏʒķ!ƒ ƔǈƪǇƉ ŧŏưƧ5 yǆ ƽ5ķķ ŎǋĂ ƧĜƶƪǖƒ ƘƒƧŏʒķ

.ČĜưĂư!ƒ ƧĜɳķ

ČĜưĂư!ƒ ƧĜɳķ De Long et, al. (1989, 1990,1991) ƘĜƪƒƧþ Ƙ!ĂĜǉķ þǀ5

Ǆǌŏþ! ǇƉ ǈŘ‡ ǇĂþǀķƶŏ) ǇŏŘ!ƒ ǁƑŬĂƉ ǄǌǉǈǈČĜưĂư!ƒ ƧĜɳķ ƒĂ5ȸƵ ǄǌǉƉ ŧŏơ yƪĂǆ ý‡Ƭǈ

ǀƧŏƬp ǄǌpĜ5Ɖ ČĜưĂư!ƒ ƧĜɳķ ǇƉ ĜǆǈĂ (ýǈǀķƪǆ!ƒ Ŏ5 ƧĜƶƪǖƒ ǇƵ ŧƬĜƤ ƘĜǆĂǁƶǆ

.ǇĂŏǉǘǀƶ!ƒ ƧĜɳķ!ƒ ĜǌƶpĂķŏ ǇƉ Ǉ‡ǆŏ ǘ5 ŧƑƱĜƤ ǄǌķƒƧĂƬķĂ

ƔǁɳŏČĜưĂư!ƒ ƧĜɳķ ǁĂǁƪǈ ƋǈǉķǃĬǁƵ ǀƧþ!!ƒ ǄþƵ ǇƋ5 Ưƒ ƧķƽŬƒ ƒŘǌ! ƻƧƱǉĂ

ĜǌƱƪĂķǆ Ĭ!ǫ þĂƶķ Ǉ! ČĜưĂư!ƒ ƧĜɳķ ƘƒþǀķƶǆǇƉ Ăǋ ƧƱƤ!ƒĂ ÜƽĂƪǁ! ŧŏ5Ĝưǫ ƧƱĜƤǆ

.ČĜǉǖƒ ǉŘǋ Ŏ5 Ĝ5ƧƱķ Ƨλ‡Ɖ ƠǈƬķ ǇƉ Ǉ‡ǆŏĂ ŧǁŏĂƱ ǀƧķ5!

ƧƒƧǀķƪĜǈ ŧŏǉǘǀƶ!ƒ ƘĜƶpĂķ!ƒ ǇĂ‡ķ ĜǆþǉƵ) ŧŏơǈƧǁ! ŧƵƨƵƨǆ!ƒ ƘĜƶpĂķǁ! ýĜλǆ‡Ă

ƧĜǆλķƪƒ ĂƉ ýǘʒķƪƒ ƒ ƬƤǆ ý‡Ƭǈ De Long et, al. (1990) ƒĂƪƧþ þǀ5 .(ƧĜƶƪǖƒ

ƧĜɳķ þĂɳĂ yǆĂ ŧǆĜķ ŧƪ5ĜǉǆþĜƬķƿƒ Ŏ5 ǈǉƒ ǇŏǈķĂ ÜČĜưĂư!ƒ ƧĜɳķ! ŧƑƱĜƤ!ƒ ǄŏǋĜ5ǆ!ƒ

[illegible] (Risk-Averse) [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] (Tax-and Non-Tax Motives,) [illegible]
.Lakonishok and Smidt (1989)

[illegible]

[illegible]

(Hiemstra and Jones 1994)[illegible]

[illegible] Bremer and Kato (1996) [illegible]

[illegible]

[illegible] (abnormal)

ǂŏǴnjǉ) ƧƒƦƈ ƧnjT ǁ!Ʀ Ǒ5 Ǵdžƅ ǂǈdžǴǂ ǂŏ!Ǵdž!ƒ lƧƙ5!ƒ ýǍƱ Ǐǈ Ƶ (significantly positive)

.lƧƪǴP!ƒ ƘǴǂƧT!ǈ! Ǵƅ!Ǵƪ ǇǴǂ ǋǉƒǍ (ǂŏǉǴƅǴŏ!ƒ ƘǴǂƧT!ƒ ǅƱƶdž! ǂŏ!Ǵdž!ƒ ǂǉƪ!ƒ

ýƥƶdž Ǐǈ Ƶ ƻŏƶư ƧŏƛƋƙ Ǵnj! ǂŏ!Ǵdžƪ DƧ!ƒ ƟǴƅƧǕƒ Ǐǈ Ƶ ƔƑƒƧư!ƒ ǇD ǁ!Ʀƅ ƒǍƞƙǉƙƪƒǍ

lƧƱŏƪ!ƒ ƯƧ5! ýǍƒƥƙ!ƒ ƭƑǴlơ ƻŏƧơƙ! lƧƞǴƙdž ƴ5ƒǍƥ ǁǴǉNj ǇƒǍ ǕǇǴƅǴŏ!ƒ Ǒ5 ǄnjƪǕƒ ǇƒƧǍƥ

.ƧǴƞƙ!ƒ ƘǕdžǴƶƙ Ǐǈ Ƶ

ƘǁƑƙǁƐ üƬƻǁƐ

ƕƼǴƑƨǁƐ ƪƑƨƐƥƣǁƐ

.ƕƊƢƣƾƊƢǁƐ .Č

.ƕƞǴƥƴǁƐ ƪƑƨƐƥƣǁƐ .č

.ƕƞǴǆƜŬƐ ƪƑƨƐƥƣǁƐ .Ď

.ƕƼǴƑƨǁƐ ƪƑƨƐƥƣǁƐ ţ ƠǂƊƢ .ď

.ƑǉƥƞƷ ƊƢƳ ƕƨƐƥƣǁƐ ǇƤǉ ƦƞƊƢƞ ƑƊƢ .Đ

(Vector Autoregression Model)

(VAR)

:Darwish (2011) .

(GARCH)

(Day-of-The

.Week Effect)

.(Noise Trading)

:Boubaker and Makram (2011) .

(GARCH)

(SIAH) (MDH)

[illegible] (GARCH) [illegible]

[illegible]

[illegible] .(MDH) [illegible]

:Abd El Aal et, al. (2011)

[illegible]

1- Exponentially Weighted Moving Average (EWMA).
2- Autoregressive Conditional Heteroscedastic (ARHC).
3- Generalization Autoregressive Conditional Heteroscedatic (GARCH).
4- Asymmetric GARCH models.

[illegible] (GARCH) [illegible]

A- The Glosten, Jagannathan, and Runkle Model.
B- The EGARCH Model.

[illegible] (HFI,CIBC100,EGX30)

[illegible] (EGARH) [illegible] (MAPE, RMSN, MAE) [illegible] Diebold and Mariano Test (MD) [illegible]

:Tripathy (2010)

[illegible]

GARCH, EGARCH, PGARCH,) [illegible]

[illegible] (TARCH, ARCH

[illegible] (scripts) [illegible]

[illegible]

:Mahasan and Singh (2008)

[illegible]

[illegible] (SENSEX) [illegible] (GARCH) [illegible]

[illegible]

[illegible] (GARCH) [illegible]

[illegible] (GARCH and ARCH) [illegible]

:Lu and Lin (2010)

(VAR)

(SAIH) (MDH)

:Mubarik and Javid (2009)

(VAR)

GARCH

:Tudor and Miron (2009)

(Granger-Causality)

:Chiang et al, (2009)

(Realized Model) (NASDAQ)

[illegible]

[illegible]

[illegible] (Granger) [illegible]

[illegible]

[illegible]

[illegible] (SAIH) [illegible]

[illegible]

:Medeiros and Doornik (2008) [illegible]

[illegible]

Cross-) [illegible]

Bivariate) [illegible] (Unit-Root tests) [illegible] (Correlation analysis

[illegible] (GARCH) [illegible] (simultaneous equations regression analysis

[illegible] .(Granger Causality tests) [illegible] (VAR-models)

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] (Granger Causality tests)

[illegible]

:Deo et al, (2008) .[illegible]

[illegible]

[illegible] (Granger) [illegible]

[illegible]:

Linear and Non-Linear Trend in Trading Volume.
Test for Unit Roots.
Causal Relation between Trading Volume and Stock Price Changes.
Trading Volume and Conditional Volatility.

[illegible]

[illegible] (Granger) [illegible]

[illegible]

:Chukwuogor (2008) .[illegible]

[illegible] (JSE) [illegible] (LSE) [illegible] (All Share Index) [illegible] (CCSI) [illegible] (Botswana Domestic Companies) [illegible] (equality) [illegible] (Parametric and nonparametric Test) [illegible]

[illegible]

:Mahajan and Singh (2008)

(SAIH)

VAR, GARCH,)

(ARCH

National Stock Exchange

.(NSE)

:Kiymaz and Girard (2007)

(GARCH)

[illegible]

[illegible] :Girard and Biswas (2007)

[illegible] (TARCH) [illegible]

[illegible] : Nor and Cheong (2007)

[illegible] (VAR) [illegible]

:Kalbani (2005) [illegible]

[illegible] (VAR) [illegible]

[illegible]

:Darrat et al, (2003) [illegible]

[illegible] (Lead-Lag [illegible] Relation) [illegible] Dow Jones Industrial [illegible] (DJIA) Average [illegible] (DJIA) [illegible] (EGarch) [illegible] (GRANER-causality) [illegible] (Lead-Lag Relation) [illegible]

[illegible] (DJIA) [illegible] (MDH) [illegible]

Lead-) ƜƦǍdžǉ ƟǍư Ǎƅ DžƵƥƙ ǇFǴƙǉ!ƒ ǇD ƚǒơ (SAIH) ƚǒưƧ5 DžƵƥƙ! ƘƇǴƞ (MDH)

.(DJIA) DžnjƪD ǇdžƧǒƅƚ ƥƥƵ Ǒ5 (Lag

:Goetzmann and Massa (2003) .ČĚ

ƧǴƛǕƒ ǇdžƥǒƥƺƸ ƒ ƒ ǖƤƙƪƒǍ ǇǒƧdžƛƙƪdžǈ! Ǒƚ ǍǈƪǃƒƧƮǉƺ!ƒ ƧǒƥǀƘƅ ƚƪƒƧƥ!ƒ ǉƦǋ ƘdžǴƿ

ƚǒƞǒƙƒƧƙƪǫ ǇǍƶƅƙǒ ǇǒƦ!ƒ ǇǒƧdžƛƙƪdž!ƒ ƥƥƵ ƖƧƛƚ ǇǒƅƚƺƿǍƙdž!ƒ ƚƿǖƺ!ƒ ƴǍơ ƧǴƅƙƤǖ! ƚǈƅǴǀ!ƒ

ǐƥƧ5!ƒ ƘǴƅǴƪơ!ƒ ǇƵ ƖƧǴƅƵ ƘǴǉǴǒƅ!ƒ ƘǉǴƚǍ ǗƨǍƪ!ƒ Ǒ5 (Disposition-Prone)

ƘǴǉǴǒƅ!ƒ ǉƦǋǍ (Nationwide Discount Brokerage Firm) ǴǋƧ5Ǎǒ Ǒƙ!ƒ ǇǒƧdžƛƙƪdžǈ!

čĕĕč/č/č Ǉdž ƖƧƙ5ǈ! Ƨdžƛƙƪdž ĔĒǗČČČ Ǉdž ƧƛƚǕ ƔǴƪơ čČČǗČČČ Ǉdž ƧƛƚD ǏǈƵ ǐǍƙơƙ

ǇǒƦ!ƒ ǇǒƧdžƛƙƪdž!ƒ ƥǒƥơƙ! ǇǒƧdžƛƙƪdžǈ! ƧǒƅƚƺƒƥƺƸ!ƒǍ ƚǉǒƺ!ƒ DžƞơƧƅƚǍ čĕĕĒ/čč/ĎĚ Ǐ!ǫ

ǴǴǉƅ! Džnjǒƥ! ƴǍƒƥƙ!ƒ ƔǍǈƪD DžƒƥƤƙƪƒ DžƛǍ ǇdžǍ (Disposition-Prone) ƧǒƛdžƙǍ ǇǍƺưƤǒ

.ƚǒƚǍǈƪ!ƒ ƴdžƒǍƺ!ƒ

DžǴƵ ƴƚƬƅ ƥdžƙƺƙ ƥƑǍƺ!ƒ ƘǴƅǈƙǍ ƴǍƒƥƙ!ƒ DžƞơǍ Ǉdž ǕƚǇD ǏǈƵ ƚ!ƥD ƚƪƒƧƥ!ƒ ƘƥƞǍ ƥƿǍ

ǇǍƶƅƙǒ ǇǒƦ!ƒ ǇǒƧdžƛƙƪdž!ƒ ǏǈƵ ƥdžƙƺƙ ƒƥǒƥơƙ ƧƛƚD ƴƚƬƅǍ ǗƨǍƪ!ƒ ƚƅǒƚƧƙ ǍD ƚǒǉƅ ǏǈƵ

.(Disposition-Prone) ƚǒƞǒƙƒƧƙƪǫ

:Sabri (2008) .čċ

ƴƞƒ Ǉdž ƚǒƅƧƵ ƚǒ!Ǵdž ƨƒǍƪD Ĕ ù! ƴǍƒƥƙ!ƒ DžƞơǍ DžnjƪǕƒ ƧǴƺƪD ƚƚƧơ ƚƪƒƧƥƅ DžǴƿ

Ǵdžƚ ƚǒƧnjƬ ƘǴǉǴǒƅ DžƒƥƤƙƪǴƅ ǗDžnjƪǕƒ ƧǴƺƪD ƘǴƅǈƙ ǏǈƵ ƴǍƒƥƙ!ƒ DžƞơƒǑ5 ƘƒƧǒƺƙ!ƒ ƧƛƒƥǒƥơƙƒǍ

) ƚǒƱ5ǉ ƧǒƸ ƚƺƅƧD Ǎ ƚǒƱ5ǉ ƴǍƥ ƚƺƅƧǕ Arab Monetary Fund (AMF) ǴǋƧnjǗD

ƧƮƋdž DžƒƥƤƙƪǴƅ ǁ!ƦǍ (ǇǴdžƵ ǗǇǒƧơƅ!ƒ ǗƘǒǍƚ!ƒ ǗƚǒƥǍƺƪ!ƒ ǗǇǴǉƅ! ǗƔƧƸdž!ƒ ǗǇƥƧǕƒ ǗƧƮdž

Ǉdž ƖƧƙ5ǈ! (AMF) ǴnjƸǴƮ Ǒƙ!ƒǍ (unified stock price index) ƥơǍdž!ƒ Džnjƪ!ƒ Ƨƺƪ

.ĎČČĒ ǏǕ!ƒ čĕĕĐ

[illegible] (Standard Deviations) [illegible] Correlation) [illegible] (Linear Association) [illegible] (Coefficient [illegible].

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]
(Č-ď) [illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible] (VAR)	[illegible]	[illegible]	[illegible] (ĎČČĚ)
[illegible]	[illegible] (GARCH)	[illegible]	[illegible]	Darwish (2011)
[illegible]	[illegible] (GARCH)	[illegible]	[illegible]	Boubaker and Makram (2011)

[illegible]				
Diebold and [illegible] Mariano Test (MD) [illegible]	GARCH, ARCH, EGARCH	[illegible]	[illegible] (HFI,CIBC100,EGX30)	Abd El Aal et, al. (2011)
[illegible]	GARCH,) EGARCH, PGARCH, TARCH, (ARCH	[illegible]	National Stock Exchange [illegible]	Tripathy (2010)
[illegible]	[illegible] (GARCH)	[illegible] (SENSEX)	[illegible]	Mahasan and Singh (2008)
[illegible]	[illegible] (VAR)	[illegible]	[illegible]	Lu and Lin (2010)
[illegible]	[illegible] (VAR)	[illegible]	[illegible]	Mubarik and Javid (2009)
[illegible]	[illegible] Granger-Causality	[illegible]	[illegible]	Tudor and Miron (2009)
[illegible]	[illegible] Granger-Causality	[illegible]	[illegible] (NASDAQ)	Chiang et al, (2009)

[illegible]	[illegible] (GARCH) (VAR-) Granger) Causality tests	[illegible]	[illegible]	Medeiros and Doornik (2008)
[illegible] (Granger Causality tests) [illegible]	[illegible] (Ganger Causality Test)	[illegible]	[illegible]	Deo et al, (2008)
[illegible]	[illegible] Parametric and nonparam-etric Test	[illegible]	[illegible]	Chukwuogor (2008)
[illegible]	[illegible] VAR,) GARCH, (ARCH	[illegible]	National Stock [illegible] Exchange [illegible]	Mahajan and Singh (2008)
[illegible]	[illegible] (GARCH)	[illegible]	[illegible]	Kiymaz and Girard (2007)

[illegible]	[illegible] (TARCH)	[illegible]	[illegible]	Girard and Biswas (2007)
[illegible]	[illegible] (VAR)	[illegible]	[illegible]	Nor and Cheong (2007)
[illegible]	[illegible] (VAR)	[illegible]	[illegible]	Kalbani (2005)
[illegible] (MDH) [illegible] (SAIH) [illegible] (Lead-Lag) [illegible] .(DJIA) [illegible]	E- [illegible] GARCH & Grander-Causality	[illegible] (DJIA) [illegible]	Dow [illegible] Jones Industrial Average (DJIA)	Darrat et al, (2003)
[illegible] .(Disposition-Prone) [illegible]		[illegible] Nationwide) Discount Brokerage (Firm	[illegible]	Goetzmann and Massa (2003)
[illegible]	تم استخدام معادلات standard deviations	[illegible] Arab [illegible] Monetary	[illegible])	Sabri (2008)

[illegible]	& linear association	Fund (AMF) [illegible]	[illegible]	

[illegible]

[illegible] (Ali kalbani) [illegible] 2005 [illegible] (VAR) [illegible] (Granger Causality test) [illegible] .(Contemporaneous)

[illegible] Vector Error Correction) [illegible]

ƗƮƒƧƥ!ƒ ǉƦǋ ƨŏďžƙƙ Ǵďž‡ (Model, Johnson Cointegration test, Granger Causality

.ĎČčč ǅǴƵ Ĭ!ǫ ĎČČĎ ǅǴƵ ǇǅďžƘƒĂǉƮ čČ ŎǋĂ Ǵǌƙ!ĂǴǉƙ Ŏƙ!ƒ Ɨŏǉďžƨ!ƒ ƖƧƙƺ!Ǵǚ

ƲǴƐƀǁƐ üƮƧǁƐ

ƸƨƐƥƳǁƐ ƸǓƜǋǆǅǅ

.ƸƨƐƥƳǁƐ ƪƑǆƑǓǴ Č-ď

. ƪƑǅǊǂƴǅǁƐ ƲǅƜ ƥƳƑƮǅ č-ď

.ƑǋƨƑǓƽǊ ƸƨƐƥƳǁƐ ƪƐƥǓƸƗǅ Ď-ď

ƸƨƐƥƳǁƐ ƚǷǊǅǆ ď-ď

(Volume)

(VOL)

$$VOL = \log(Q)$$

Q:

(Return) [illegible]

[illegible]

[illegible]:

$$Return = ln\frac{Pt}{Pt-1}$$

Pt: [illegible]

Pt-1: [illegible]

(Volatility) [illegible]

[illegible]

[illegible] (VOT) [illegible]

[illegible]:

$$VOT = R^2$$

[illegible]:

[illegible] (Vector Error Correction Model) [illegible]

(Granger) [illegible] (Cointegration Johansen test) [illegible] (VEC) [illegible]

[illegible] Causality test

[illegible].

[illegible]:

- [illegible] (Granger Causality test) [illegible] [illegible].

(ĭǴùƕǆĂƕ) ƽĂʅ Ƙʅƻþ ŎƙǃƒĂ Mahasan and Singh (2008) ƗʅƒƻþƘǆǴþ Ɨŏơ

ƘǴùƕǃƖƙĂ ýĂƒþùƙǃƒ Ǆùƞơ ǇŏƕƗŏƕƕʅǃƒ ƗƥŭƶǃƒƧǴƕƙƤŬ (Granger) ɯƦĂǆǉǄƒþƤƙʅǴƕ þǉǌǃƒ Ŏ5

Ĭùǃʐ ƘùŏƧƞ Ŏùƙǃ ƒĂ Tudor and Miron (2009) ƗʅƒƻþƘǆþƤƙʅƒǴǆƗ ǗǄǌʅǕƒ þƑƒĂƵ

Ǆùƞơ Ǉŏùƕ ƗŏƕƕʅùǃƒƗƥŭƶǃƒƧǴƕƙƤŬ (Granger) ɯƦĂǆǉ (ƗŏǃǴǆǃƒ ƽƒƧĂũ! ƘʅƧǴƤĂƕ ƽĂʅ)

.þƑƒĂƶǃƒ ƘǴƕǃƖƙĂ ǄǌʅǕƒ þƑƒĂƵ Ǉǆ ŭƗĂ ýĂƒþƙǃƒ

ƽƒƧĂũù! ǇŏƱʅùǃ5 ƽĂùʅ) Ƙùʅƻþ Ŏƙǃƒ Darwish (2011) Ɨʅƒƻþƫ ƘƒƧŏʒƙǆǃƒ

.(ƧĂƕǆǃŬƒĂƫ) ƽĂʅ Ƙʅƻþ Ŏƙǃƒ Nor and Cheong (2007) ƗʅƒƻþĂ Ü(ƗŏǃǴǆǃƒ

:ƗŏǃǴƙǃƒ ƘŬþǴƶǆǃƒ ƗƸǴŏƬ Ǆƙ Ɨƥŭƶǃƒ ǉƦǊ ƧǴƕƙƤŬĂ

$$VOL(t) = a_0 + \sum_{i=1}^{n} a_{1i}\,\Delta VOL(t-i) + \sum_{i=1}^{n} a_{2i}\Delta Rutern(t-i) + e_{it}$$

$$Rutern(t) = a_0 + \sum_{i=1}^{n} a_{1i}\,\Delta Rutern(t-i) + \sum_{i=1}^{n} a_{2i}\Delta VOL(t-i) + e_{it}$$

$$VOL(t) = a_0 + \sum_{i=1}^{n} a_{1i}\,\Delta VOL(t-i) + \sum_{i=1}^{n} a_{2i}\Delta VOT(t-i) + e_{it}$$

$$VOT(t) = a_0 + \sum_{i=1}^{n} a_{1i}\,\Delta VOT(t-i) + \sum_{i=1}^{n} a_{2i}\Delta VOL(t-i) + e_{it}$$

Vol: ŎǆĂŏǃƒ ýĂƒþƙǃƒ Ǆƞơ

Return: ƗŏǆĂŏǃƒ þƑƒĂƶǃƒ

VOT: þƑƒĂƶǃƒ ƘǴƕǃƖƙ

- ƨǴǩƤŬ Ɨƿǖƶ ýǆǴǂǩ!ƒ ƗǜǒǍƱ ýƞŰƒ ǅǑǜ Ǉƞơ ýǍƒƥǩ!ƒ ƥƑƒǍƸǍ ǅǑǜ Ǉƞơ ǅǆǍ Ƒǌƞ ǅǑǜǍ

Johnson) ǏǜǇƸ ƥǴǜǆǩƸǛƒ ǅǩǒǜ ǎ ǍƨǜƤƉ Ƒǌƞ ǅǆǍ ƥƑƒǍƸ!ƒ ƘǴǜǇǩǍ ýǍƒƥǩ!ƒ Ǉƞơ
.(Cointegration test

ǑǜƼ (DAX) ƨǜƬǆǍ ǏǜǇƸ ƘǒƨƞƉ Ǒǩ!ƒǍ Liesenfeld (2002) ƗǎƒƨƤ ƘǆǴƥ Ɨǒơ
ǅǑǜƅ ýƞŰƒ ƗǜǒǍƱ ýǆǴǂǩ!ƒ Ɨƿǖƶ ƨǴǩƤŬ (Cointegration) ƨǴǩƤƒ ǅƒƥƤǩǎǴ ǴǑǆǴǆǍ!ƉƘ
.Ǉƞǎ ƥƑƒǍƸǍ ƘǴǜǇǩǍ ýǍƒƥǩ!ƒ Ǉƞơ

:ǅǑǩǑ!Ǵǩ!ƒ ǅǑǩ!ƥǴǆǍ!ƒ ƗƸǴǑƬ Ǉǩ Ɨƿǖƶ!ƒ ǈǚǈ ƨǴǩƤŬǍ

$$VOL_t - VOL_{t-1} = \alpha(VOL_{t-1} - dReturn_{t-1}) + \beta(Rrturn_{t-1} - Return_{t-1})$$
$$lagged\,(\Delta Return\ and\ \Delta VOL) + e_t$$

$$VOL_t - VOL_{t-1} = \alpha(VOL_{t-1} - dVOT_{t-1}) + \beta(VOT_{t-1} - VOT_{t-1})$$
$$lagged\,(\Delta Return\ and\ \Delta VOL) + e_t$$

d: (stationary) ǅǍƗǎ!ƒ ƽǑǐƞǩ! ƗǆƨǗ!ƒ ƗǑǈǆƨ!ƒ ƘƒƨǩƼ!ƒ ƥƥƸ

- Ɨƿǖƶ!ƒ ƨǑƥǐǩ! (Vector Error Correction Model) ǛǚǍǆǇ ǅǒƥƤǩǎƒ Ǉǩ ǑƥƿǍ ǛǚǍǆǇ!ƒ ƒǚǈ ǅǒƥƤǩǎƒ Ǉǩ ƥƿǍ (Short Run) ýƞŰƒ ƨǑƬƿ ǍƥǆǍ!ƒ ǏǜǇƸ ƗǑƗǑǆǇǑƥ!ƒ
ƥǍƞǍ ƳǜǎǜƲǍ (VAR) ǜǜ ƧǍƨǆǆ!ƒ ǍƉ (vector Autoregression Model) ǅǆǍ
(Lag) ƥƥƸ ƥǑƥơǩ Ǉǩ ƥƿǍ ƘƒƨǑǃǆǍ!ƒ ǅǑǜ ǑǇƸ (Cointeration) ǁƨǩƬǆ ýǆǴǂǩ
. (Akaike Information Criterion) ǏǜǇƸ ǅǴǈǜǜ (Ď) ǑǊǍ

ƨǴǩƤŬ (VAR) ǛǚǍǆǇ Mubark and Javid (2009) ƗǎƒƨƤ ƘǆƥƤǩǎƒ ǴǆƗ
ǅǴǩǎƗǴǜ!ƒ ƽǍǎ ƘǎƨƤ Ǒǩ!ƒǍ ǛƨǑƬ!ƒ ǍƥǆǍ!ƒ ǏǜǇƸ ƥƑƒǍƸ!ƒ ƘǴǜǇǩǍ ýǍƒƥǩ!ƒ Ǉƞơ ǅǑǜ Ɨƿǖƶ!ƒ

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$$D(VOL) = \beta_0 + \beta_1 * (VOL_{-1}) + \beta_1 * (VOT_{-1}) + \beta_2 * (VOL_{-1}) + \beta_2 * (VOL_{-2}) + \beta_3 * (VOT_{-1}) + \beta_3 * (VOT_{-2})$$

$$D(VOT) = \beta_0 + \beta_1 * (VOL_{-1}) + \beta_1 * (VOT_{-1}) + \beta_2 * (VOL_{-1}) + \beta_2 * (VOL_{-2}) + \beta_3 * (VOT_{-1}) + \beta_3 * (VOT_{-2})$$

$$D(VOL) = \beta_0 + \beta_1 * (VOL_{-1}) + \beta_1 * (Return_{-1}) + \beta_2 * (VOL_{-1}) + \beta_2 * (VOL_{-2}) + \beta_3 * (Return_{-1}) + \beta_3 * (Return_{-2})$$

$$D(Return) = \beta_0 + \beta_1 * (VOL_{-1}) + \beta_1 * (Return_{-1}) + \beta_2 * (VOL_{-1}) + \beta_2 * (VOL_{-2}) + \beta_3 * (Return_{-1}) + \beta_3 * (Return_{-2})$$

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Đ-Č ǀƐƀƑƬƟǛǀ ǀ ǈƴƸƬǋǁǀ.

Đ-č üǐǂƟƗ ǀƐƥƑƓƗƠǛǀ ǀ ƑǈǁǄǀƑƗǆǈ.

Đ-č-Č ƥƑƓƗƠǀ **Johansen Cointegration test**.

Đ-č-č ƥƑƓƗƠǀ **Granger Causality test**.

Đ-č-Ď ƥƑƓƗƠǀ **Vector Error Correction Model**.

Ƨ ǅǰƪǁǁƐ üƬƻǁƐ

ƖƑǅƑǏǴǁƐ üǐǂƟƗ

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ýùöǁơǩ! ǑƑǴƮơǕƒ (EViews) ǋǅǴǇƧǅ ǏǁƵ þǴǅǩƵǕǴǅ þƑƒĂƺ!ƒ ƘǴǅǁǀǩĂ ǅǌƪǕƒ þƒĂƵ ǇǅǏ ýǂĂ

:ǴǌƞƑǴǩǇ Ơöư ĂǩĂ ƘǴǇǴǅ!ƒ ýöǁơǩĂ ƗöƽƮĂ!ƒ ƘƒƇǴƮơǕƒ Ǒǁö ǴǅöƼĂ ƘǴǇǴǅ!ƒ

ǅǐƻƬǋǁƐ ƖƐƥƑƬƟǕƐ Č-Đ

ǅùƞơ! ǑǅǴƪùơ!ƒ ƱƪĂ!ƒ ǇǅǅǇǑǅǩ (č-đ) ǅpƧ ƗöƽƮĂ!ƒ ƘƒƇǴƮơǕƒ ýĂþƞ ýǚƤ ǇǅǏ

ǇǑùǅ ƟĂƒƧǩö ýĂƒþǩ ǅƞơ ǇǴǂĂ (Đ,đĚč) Ʊöƪ Ă!ƒ ǇǴǂ ǴǅǇǑǅ (Đ,đĎđ) ǇǴǂ (VOL) ýĂƒþǩ!ƒ

ǴǌƱùƪĂ ǇùƵ ǅöùǀ!ƒ ǇƦǋ ƻƒƧơǇƒ ƩǅǅþpĂ ǏǇþǅ þơǂ (-Č,ďĐē) Ă ǏǁƵǅ þơǂ (Ě,đČĐ)

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ǇǴùǂĂ (Đ,čēĐ) ƱöùƪĂ!ƒĂ (Đ,čČĐ) ýĂƒþǩ!ƒ ǅƞơ ƗöǅǂƗ! ǑǅǴƪơ!ƒ ƱƪĂ!ƒ ǇǴǂ ǴǅǇǑǅ

þùơǂ (ē,ĒĐĎ) ǇǑùǅ ƟĂƒƧǩǩ ƘǇǴǂ Ǒǩ!ƒĂ (č,Čďď) ǑǅǴƪơ!ƒ ǴǌƱƪĂ ǇƵ ǅöǀ!ƒ ǇƦǋ ƻƒƧơǇƒ

.ǏǇþǅ þơǂ (Č,ČČČ) Ă ǏǁƵǅ

ǇƵ ǐƧǴöƺǅ ƻƒƧơǇǴǅ (Ď,ĐďČ) ƱöƪĂ!ƒĂ (đ,ēēē) Ƨƺƪǁ! ǑǅǴƪơ!ƒ ƱƪĂ!ƒ ǇǴǂ þpĂ

.ǏǇþǅ þơǂ (Č,čĒČ) Ă ǏǁƵǅ þơǂ (ďĒđ) ǇǑǅ Ƨƺƪ!ƒ ƟĂƒƧǩ þpĂ (ĎČ,ďď) ƧƒþǀǅǅƱƪĂǩǅ!ƒ

ǇǴùǂ þùǀ5 Ʊöùƪ Ă!ƒ ǁ!ǋǂĂ (Č,ČČČ) ǅǌƪǕƒ þƑƒĂƺ! ǑǅǴƪơ!ƒ ƱƪĂ!ƒ Ɨǅöp ƘǇǴǂ þpĂ

ǏùǁƵǅ þùơǂ (Č,ďčĚ) ǇǑùǅ Ƨƺƪù!ƒ ƟĂƒƧǩ ǂöơ (Č,ČĎē) ǐƧǴöƺǅ ƻƒƧơǇǴǅ (Č,ČČČ)

.ǏǇþǅ þơǂ (-Ď,ďčĎ)Ă

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	VOL	QTY	PRICE	RETURN	VOT
Mean	4.525	4.104	5.777	0.000	0.001
Median	4.581	4.174	2.430	0.000	0.000
Maximum	8.504	7.642	365.000	0.318	5.345
Minimum	-0.347	0.000	0.160	-2.312	0.000
Std. Dev.	1.120	1.033	20.330	0.027	0.019

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Johansen Cointegration Test [illegible] Č-č-Đ

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(Johnson Cointegration test)

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	Hypothesized		Trace	0.050	≥ 0.05
	No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
co1	None	0.196*	426.124	15.495	0.0001
	At most 1	0.017*	31.164	3.841	0
co2	None	0.182*	377.872	15.495	0.0001
	At most 1	0.028*	47.390	3.841	0
co3	None	0.127*	253.810	15.495	0.0001
	At most 1	0.024*	38.757	3.841	0
co4	None	0.176*	301.831	15.495	0.0001
	At most 1	0.019*	26.767	3.841	0
co5	None	0.150*	282.245	15.495	0.0001
	At most 1	0.046*	63.442	3.841	0
co6	None	0.192*	287.208	15.495	0.0001
	At most 1	0.039*	44.705	3.841	0
co7	None	0.149*	203.832	15.495	0.0001
	At most 1	0.011*	12.875	3.841	0.0003
co8	None	0.190*	404.205	15.495	0.0001
	At most 1	0.045*	71.788	3.841	0
co9	None	0.171*	376.959	15.495	0.0001
	At most 1	0.027*	47.746	3.841	0
co10	None	0.158*	346.692	15.495	0.0001
	At most 1	0.015*	28.418	3.841	0
co11	None	0.399*	177.405	15.495	0.0001
	At most 1	0.035*	11.468	3.841	0.0007
co12	None	0.167*	365.029	15.495	0.0001
	At most 1	0.016*	29.443	3.841	0
co13	None	0.251*	151.064	15.495	0.0001
	At most 1	0.088*	36.515	3.841	0
co14	None	0.207*	391.352	15.495	0.0001

	Hypothesized		Trace	0.050	≥ 0.05
	No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
	At most 1	0.055*	77.318	3.841	0
co15	None	0.190*	304.393	15.495	0.0001
	At most 1	0.009*	12.297	3.841	0.0005
co16	None	0.148*	254.960	15.495	0.0001
	At most 1	0.011*	16.397	3.841	0.0001
co17	None	0.158*	161.739	15.495	0.0001
	At most 1	0.027*	22.176	3.841	0
co18	None	0.198*	159.082	15.495	0.0001
	At most 1	0.079*	43.215	3.841	0
co19	None	0.201*	272.849	15.495	0.0001
	At most 1	0.020*	22.200	3.841	0
co20	None	0.188*	99.557	15.495	0.0001
	At most 1	0.050*	19.562	3.841	0
co21	None	0.157*	177.739	15.495	0.0001
	At most 1	0.024*	21.981	3.841	0
co22	None	0.141*	222.887	15.495	0.0001
	At most 1	0.015*	19.550	3.841	0
co23	None	0.168*	263.380	15.495	0.0001
	At most 1	0.009*	12.795	3.841	0.0003
co24	None	0.140*	274.735	15.495	0.0001
	At most 1	0.014*	24.064	3.841	0
co25	None	0.152*	306.158	15.495	0.0001
	At most 1	0.006*	11.340	3.841	0.0008
co26	None	0.135*	249.197	15.495	0.0001
	At most 1	0.013*	21.073	3.841	0
co27	None	0.165*	234.565	15.495	0.0001
	At most 1	0.036*	39.934	3.841	0
co28	None	0.066*	147.088	15.495	0.0001
	At most 1	0.014*	25.905	3.841	0
co29	None	0.171*	178.915	15.495	0.0001
	At most 1	0.022*	19.001	3.841	0
co30	None	0.150*	258.789	15.495	0.0001
	At most 1	0.016*	22.986	3.841	0
co31	None	0.175*	208.168	15.495	0.0001
	At most 1	0.022*	21.406	3.841	0
co32	None	0.175*	247.280	15.495	0.0001
	At most 1	0.022*	25.727	3.841	0
co33	None	0.247*	265.866	15.495	0.0001
	At most 1	0.050*	40.471	3.841	0
co34	None	0.199*	373.603	15.495	0.0001
	At most 1	0.022*	34.558	3.841	0
co35	None	0.155*	225.601	15.495	0.0001

	Hypothesized		Trace	0.050	≥ 0.05
	No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
	At most 1	0.030*	34.220	3.841	0
co36	None	0.197*	398.184	15.495	0.0001
	At most 1	0.040*	62.475	3.841	0
co37	None	0.177*	185.914	15.495	0.0001
	At most 1	0.025*	21.655	3.841	0
co38	None	0.158*	327.960	15.495	0.0001
	At most 1	0.014*	24.594	3.841	0
co39	None	0.174*	320.122	15.495	0.0001
	At most 1	0.050*	67.752	3.841	0
co40	None	0.189*	389.140	15.495	0.0001
	At most 1	0.020*	33.852	3.841	0
co41	None	0.198*	448.752	15.495	0.0001
	At most 1	0.030*	53.751	3.841	0
co42	None	0.168*	262.432	15.495	0.0001
	At most 1	0.028*	34.632	3.841	0
co43	None	0.190*	342.983	15.495	0.0001
	At most 1	0.022*	33.282	3.841	0
co44	None	0.239*	368.448	15.495	0.0001
	At most 1	0.043*	51.445	3.841	0
co45	None	0.195*	281.807	15.495	0.0001
	At most 1	0.028*	32.739	3.841	0
co46	None	0.170*	327.886	15.495	0.0001
	At most 1	0.021*	33.704	3.841	0
co47	None	0.112*	171.095	15.495	0.0001
	At most 1	0.036*	40.264	3.841	0
co48	None	0.178*	316.838	15.495	0.0001
	At most 1	0.027*	38.316	3.841	0
co49	None	0.162*	359.161	15.495	0.0001
	At most 1	0.024*	42.749	3.841	0
co50	None	0.208*	297.551	15.495	0.0001
	At most 1	0.033*	37.077	3.841	0
co51	None	0.183*	216.020	15.495	0.0001
	At most 1	0.024*	23.647	3.841	0
co52	None	0.220*	273.000	15.495	0.0001
	At most 1	0.016*	16.871	3.841	0
co53	None	0.196*	319.350	15.495	0.0001
	At most 1	0.013*	17.780	3.841	0
co54	None	0.227*	438.851	15.495	0.0001
	At most 1	0.045*	66.234	3.841	0

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(Johnson Cointegration test)

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	Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.050 Critical Value	≥ 0.05 Prob.**
co1	None	0.158*	342.309	15.495	0.0001
	At most 1	0.017*	31.709	3.841	0
co2	None	0.116*	252.088	15.495	0.0001
	At most 1	0.029*	49.260	3.841	0
co3	None	0.028*	49.822	15.495	0
	At most 1	0.003*	4.152	3.841	0.0416
co4	None	0.021*	43.296	15.495	0
	At most 1	0.009*	12.601	3.841	0.0004
co5	None	0.051*	96.820	15.495	0
	At most 1	0.020*	26.958	3.841	0
co6	None	0.175*	263.099	15.495	0.0001
	At most 1	0.038*	44.256	3.841	0

	Hypothesized		Trace	0.050	≥ 0.05
	No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
co7	None	0.157*	217.795	15.495	0.0001
	At most 1	0.012*	14.846	3.841	0.0001
co8	None	0.173*	374.807	15.495	0.0001
	At most 1	0.046*	74.939	3.841	0
co9	None	0.139*	311.138	15.495	0.0001
	At most 1	0.027*	48.546	3.841	0
co10	None	0.167*	366.355	15.495	0.0001
	At most 1	0.015*	28.407	3.841	0
co11	None	0.995	1760.621	15.495	1
	At most 1	0.036*	11.951	3.841	0.0005
co12	None	0.134*	294.495	15.495	0.0001
	At most 1	0.016*	29.368	3.841	0
co13	None	0.133*	84.223	15.495	0
	At most 1	0.067*	27.495	3.841	0
co14	None	0.194*	369.052	15.495	0.0001
	At most 1	0.055*	76.183	3.841	0
co15	None	0.162*	257.466	15.495	0.0001
	At most 1	0.009*	13.182	3.841	0.0003
co16	None	0.157*	270.831	15.495	0.0001
	At most 1	0.011*	16.074	3.841	0.0001
co17	None	0.092*	101.076	15.495	0.0001
	At most 1	0.027*	22.411	3.841	0
co18	None	0.111*	100.278	15.495	0.0001
	At most 1	0.071*	38.642	3.841	0
co19	None	0.293*	407.125	15.495	0.0001
	At most 1	0.019*	20.931	3.841	0
co20	None	0.132*	71.224	15.495	0
	At most 1	0.043*	16.834	3.841	0
co21	None	0.167*	188.761	15.495	0.0001
	At most 1	0.024*	21.952	3.841	0
co22	None	0.141*	224.768	15.495	0.0001
	At most 1	0.016*	21.117	3.841	0
co23	None	0.087*	137.562	15.495	0.0001
	At most 1	0.011*	14.596	3.841	0.0001
co24	None	0.048*	106.425	15.495	0.0001
	At most 1	0.015*	25.591	3.841	0
co25	None	0.168*	340.878	15.495	0.0001
	At most 1	0.007*	11.705	3.841	0.0006
co26	None	0.164*	302.082	15.495	0.0001
	At most 1	0.014*	21.404	3.841	0
co27	None	0.105*	160.543	15.495	0.0001
	At most 1	0.037*	40.797	3.841	0

	Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.050 Critical Value	≥ 0.05 Prob.**
co28	None	0.020*	37.742	15.495	0
	At most 1	0.001	2.126	3.841	0.1448
co29	None	0.093*	103.175	15.495	0.0001
	At most 1	0.023*	19.931	3.841	0
co30	None	0.167*	287.491	15.495	0.0001
	At most 1	0.015*	22.568	3.841	0
co31	None	0.108*	130.319	15.495	0.0001
	At most 1	0.020*	19.917	3.841	0
co32	None	0.081*	121.875	15.495	0.0001
	At most 1	0.022*	25.152	3.841	0
co33	None	0.085*	111.763	15.495	0.0001
	At most 1	0.050*	40.863	3.841	0
co34	None	0.102*	198.368	15.495	0.0001
	At most 1	0.022*	34.408	3.841	0
co35	None	0.081*	128.647	15.495	0.0001
	At most 1	0.029*	33.041	3.841	0
co36	None	0.159*	325.915	15.495	0.0001
	At most 1	0.039*	61.148	3.841	0
co37	None	0.169*	177.863	15.495	0.0001
	At most 1	0.025*	21.418	3.841	0
co38	None	0.086*	184.326	15.495	0.0001
	At most 1	0.014*	25.706	3.841	0
co39	None	0.086*	188.925	15.495	0.0001
	At most 1	0.052*	70.178	3.841	0
co40	None	0.107*	225.431	15.495	0.0001
	At most 1	0.019*	32.711	3.841	0
co41	None	0.098*	234.976	15.495	0.0001
	At most 1	0.028*	50.355	3.841	0
co42	None	0.101*	160.453	15.495	0.0001
	At most 1	0.023*	29.137	3.841	0
co43	None	0.116*	214.335	15.495	0.0001
	At most 1	0.023*	33.397	3.841	0
co44	None	0.104*	177.492	15.495	0.0001
	At most 1	0.042*	50.200	3.841	0
co45	None	0.159*	232.189	15.495	0.0001
	At most 1	0.029*	33.643	3.841	0
co46	None	0.104*	209.152	15.495	0.0001
	At most 1	0.022*	34.931	3.841	0
co47	None	0.035*	41.029	15.495	0
	At most 1	0.002	2.144	3.841	0.1431
co48	None	0.087*	164.738	15.495	0.0001
	At most 1	0.025*	36.036	3.841	0

	Hypothesized		Trace	0.050	≥ 0.05
	No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
co49	None	0.182*	404.363	15.495	0.0001
	At most 1	0.025*	45.100	3.841	0
co50	None	0.096*	146.165	15.495	0.0001
	At most 1	0.029*	32.902	3.841	0
co51	None	0.085*	104.867	15.495	0.0001
	At most 1	0.020*	19.656	3.841	0
co52	None	0.269*	339.735	15.495	0.0001
	At most 1	0.016*	16.667	3.841	0
co53	None	0.116*	186.226	15.495	0.0001
	At most 1	0.011*	15.915	3.841	0.0001
co54	None	0.119*	238.914	15.495	0.0001
	At most 1	0.038*	56.194	3.841	0

Granger Causality Test

:Granger Causality

þƑfĂƵ Ŏ5 lþĠöƨ!f LJ̈́ ƧƤ̈́ Ĭlj̈ƶdžƕ Ă̈́ ÜýĂfþķ!f Dž̈ηơ Ɣƕʅķ Džnjʅ Ǖf þƑfĂƵ LJ̈́ Ŏljƶö fƦNjĂ

Tudor ƚʅfƧþ ƴdž ƚl5fĂķdž ƚηöķlj!f ljƦNj ƘCǴηĂ ÜýĂfþķ!f Dž̈ηơ Ŏ5 lþĠöƨ Ɣƕʅķ Džnjʅ Ǖf

ƘƧǴƬ̈́ (ƚö!Ġdž!f ƽfƧĂǖ! ƘʅƧǴƤĂƕ ƽĂʅ) ĬǁƵ ƘöƧη̈́ Ŏķ!fĂ and Miron (2009)

ýĂfþķ!f Dž̈ηơ LJdž Ă ýĂfþķ!f Dž̈ηơ Ĭ!ƍ þƑfĂƶ!f LJdž ljǴηķǕf ƚöþǴơ̈́ ƚöƕƕʅ ƚpǔƵ þĂηĂ Ĭ!ƍ

ƘʅƧþ Ŏķ!fĂ Kalbani (2005) ƚʅfƧþ ƘCǴη ǁ!ƦƚĂ Ü̈́Džnjʅ Ǖf þƑfĂƵ ƘĠƕǁlķ Ĭ!ƍ

ƚöƕĠηöf ƚöƕƕʅ ƚpǔƵ ƘþηĂ ƚöơ ƚpǔƶ!f ljƦNj þƚƌķ! (ƚö!Ġdž!f ƽfƧĂǖ! LJĠdžƵ ƚƮƧĂƕ)

Mubarik and ƚʅfƧþ ƘƧǴƬ̈́ Ġdžƚ ÜýĂfþķ!f Dž̈ηơ Ĭ!ƍ Džnjʅ Ǖf þƑfĂƵ LJdž NJηķķ ƚöĂp

Dž̈ηơ LJöƕ ƚöƕƕʅ ƚpǔƵ þĂηĂ Ĭ!ƍ (LJĠķʅƚĠƕ!f) Ŏ5 ƘöƧη̈́ Ŏķ!fĂ Javid (2009)

Ɣƕʅķ ĠNjƧĂþƕ Ŏķ!fĂ Džnjʅ Ǖf þƑfĂƵ Ɣƕʅö ýĂfþķ!f Dž̈ηơ LJ̈́ ƚöơ Džnjʅ Ǖf þƑfĂƵĂ ýĂfþķ!f

.ýĂfþķ!f Dž̈ηơ

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LJdž NJηķķ ƚʅfƧþ!f ƚljöƵ ƘǴƚƧƬ!f LJdž %ĎČ NJķƕʅLj Ġdžƕ đĐ ýƮ̈́ LJdž ƚƚƧƬ čč Ŏ5 %đ

ƕƾűY pƑdžlj) ƚö!Ġķ!f ƚǁöþƕ!f ƚöưƧƾ!f Ư5Ƨ Džķöʅ ƚöǁƵĂ Džnjʅ Ǖf þƑfĂƵ Ĭ!ƍ ýĂfþķ!f Dž̈ηơ

ƚljöƶ!f Dž̈ηơ LJdž %ĔČ NJķƕʅLj Ġdž! (!NJƨǓƐ ơƏƐNjY Ăǁƌ üNjƐơƚǁƐ !ɯΘ DžDž LjɯĦ ƕĭĠĠƨ

.ĠnjLjdž%ĎČ NJķƕʅLj Ġdž! Ġnj!ĂƕpĂ

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ǔöù!þ þùηķ Džù! ƚöơ ƚö!Ġdž!f ƽfƧĂǖ! LJĠdžƵ ƚƮƧĂƕ ĠNjþơf LJĠƚ ƚöƕƧƵ ƽfĂʅ̈́ lþƵ ƘʅƧþ

ƚùljöƵ ƽfĂùʅǕf ƴùödžη Ŏù5 Džnjʅ Ǖf þƑfĂƵ Ĭ!ƍ ýĂfþķ!f Dž̈ηơ LJdž NJηķķ Ŏķ!f ƚöƕƕʅ!f ƚpǔƶǁ!

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(Ð-đ) ǅǐƨ ýĂþŋ!ƒ

(Granger Cuaslity test)

ǅǐǌʅŰƒ þƑƒĂŽĂ ýĂƒþķ!ƒ ǅǐŋơ ǈǑǊ ŀǒǊʅ!ƒ ŀþŭƶ!ƒ

	Null Hypothesis:	F-Statistic	Probability ≥ 0.05
co1	RETURNCO1 does not Granger Cause VOLCO1*	8.678	0.000
	VOLCO1 does not Granger Cause RETURNCO1	0.702	0.622
co2	RETURNCO2 does not Granger Cause VOLCO2	1.441	0.207
	VOLCO2 does not Granger Cause RETURNCO2	0.892	0.485
co3	RETURNCO3 does not Granger Cause VOLCO3*	3.123	0.008
	VOLCO3 does not Granger Cause RETURNCO3	0.959	0.442
co4	RETURNCO4 does not Granger Cause VOLCO4*	2.850	0.014
	VOLCO4 does not Granger Cause RETURNCO4	1.055	0.384
co5	RETURNCO5 does not Granger Cause VOLCO5	1.393	0.224
	VOLCO5 does not Granger Cause RETURNCO5	1.411	0.218
co6	RETURNCO6 does not Granger Cause VOLCO6*	5.399	0.000
	VOLCO6 does not Granger Cause RETURNCO6	1.801	0.110
co7	RETURNCO7 does not Granger Cause VOLCO7	1.849	0.101
	VOLCO7 does not Granger Cause RETURNCO7	1.189	0.312
co8	RETURNCO8 does not Granger Cause VOLCO8	1.738	0.123
	VOLCO8 does not Granger Cause RETURNCO8	0.830	0.529
co9	RETURNCO9 does not Granger Cause VOLCO9*	2.827	0.015
	VOLCO9 does not Granger Cause RETURNCO9	0.657	0.656
co10	RETURNCO10 does not Granger Cause VOLCO10	0.378	0.864
	VOLCO10 does not Granger Cause RETURNCO10	0.491	0.783
co11	RETURNCO11 does not Granger Cause VOLCO11*	2.859	0.015
	VOLCO11 does not Granger Cause RETURNCO11	1.333	0.250
co12	RETURNCO12 does not Granger Cause VOLCO12*	5.953	0.000
	VOLCO12 does not Granger Cause RETURNCO12	0.719	0.609
co13	RETURNCO13 does not Granger Cause VOLCO13	1.047	0.389
	VOLCO13 does not Granger Cause RETURNCO13	1.039	0.394
co14	RETURNCO14 does not Granger Cause VOLCO14*	2.626	0.023
	VOLCO14 does not Granger Cause RETURNCO14	0.840	0.521
co15	RETURNCO15 does not Granger Cause VOLCO15*	9.239	0.000
	VOLCO15 does not Granger Cause RETURNCO15*	2.346	0.039
co16	RETURNCO16 does not Granger Cause VOLCO16*	7.380	0.000
	VOLCO16 does not Granger Cause RETURNCO16	1.522	0.180
co17	RETURNCO17 does not Granger Cause VOLCO17	1.569	0.166
	VOLCO17 does not Granger Cause RETURNCO17	0.934	0.458
co18	RETURNCO18 does not Granger Cause VOLCO18	1.430	0.212
	VOLCO18 does not Granger Cause RETURNCO18*	3.164	0.008

	Null Hypothesis:	F-Statistic	Probability ≥ 0.05
co19	RETURNCO19 does not Granger Cause VOLCO19*	3.772	0.002
	VOLCO19 does not Granger Cause RETURNCO19	1.871	0.097
co20	RETURNCO20 does not Granger Cause VOLCO20	0.615	0.688
	VOLCO20 does not Granger Cause RETURNCO20	2.063	0.069
co21	RETURNCO21 does not Granger Cause VOLCO21	1.772	0.116
	VOLCO21 does not Granger Cause RETURNCO21	0.184	0.969
co22	RETURNCO22 does not Granger Cause VOLCO22*	5.679	0.000
	VOLCO22 does not Granger Cause RETURNCO22	1.132	0.341
co23	RETURNCO23 does not Granger Cause VOLCO23*	6.576	0.000
	VOLCO23 does not Granger Cause RETURNCO23	0.739	0.595
co24	RETURNCO24 does not Granger Cause VOLCO24*	6.001	0.000
	VOLCO24 does not Granger Cause RETURNCO24	0.570	0.723
co25	RETURNCO25 does not Granger Cause VOLCO25*	6.875	0.000
	VOLCO25 does not Granger Cause RETURNCO25	1.129	0.343
co26	RETURNCO26 does not Granger Cause VOLCO26*	6.312	0.000
	VOLCO26 does not Granger Cause RETURNCO26	1.674	0.138
co27	RETURNCO27 does not Granger Cause VOLCO27*	4.330	0.001
	VOLCO27 does not Granger Cause RETURNCO27	1.261	0.278
co28	RETURNCO28 does not Granger Cause VOLCO28*	6.404	0.000
	VOLCO28 does not Granger Cause RETURNCO28	0.320	0.901
co29	RETURNCO29 does not Granger Cause VOLCO29*	3.836	0.002
	VOLCO29 does not Granger Cause RETURNCO29*	2.799	0.016
co30	RETURNCO30 does not Granger Cause VOLCO30*	9.157	0.000
	VOLCO30 does not Granger Cause RETURNCO30	0.616	0.687
co31	RETURNCO31 does not Granger Cause VOLCO31*	3.288	0.006
	VOLCO31 does not Granger Cause RETURNCO31	0.306	0.910
co32	RETURNCO32 does not Granger Cause VOLCO32*	2.690	0.020
	VOLCO32 does not Granger Cause RETURNCO32*	4.573	0.000
co33	RETURNCO33 does not Granger Cause VOLCO33*	4.140	0.001
	VOLCO33 does not Granger Cause RETURNCO33	1.357	0.238
co34	RETURNCO34 does not Granger Cause VOLCO34*	14.169	0.000
	VOLCO34 does not Granger Cause RETURNCO34	1.773	0.115
co35	RETURNCO35 does not Granger Cause VOLCO35*	5.322	0.000
	VOLCO35 does not Granger Cause RETURNCO35	0.568	0.725
co36	RETURNCO36 does not Granger Cause VOLCO36	1.024	0.402
	VOLCO36 does not Granger Cause RETURNCO36	2.205	0.051
co37	RETURNCO37 does not Granger Cause VOLCO37	0.746	0.589
	VOLCO37 does not Granger Cause RETURNCO37	1.970	0.081
co38	RETURNCO38 does not Granger Cause VOLCO38*	10.304	0.000
	VOLCO38 does not Granger Cause RETURNCO38	0.941	0.453
co39	RETURNCO39 does not Granger Cause VOLCO39*	5.169	0.000
	VOLCO39 does not Granger Cause RETURNCO39*	2.708	0.019
co40	RETURNCO40 does not Granger Cause VOLCO40*	13.240	0.000

	Null Hypothesis:	F-Statistic	Probability ≥ 0.05
	VOLCO40 does not Granger Cause RETURNCO40	1.332	0.248
co41	RETURNCO41 does not Granger Cause VOLCO41*	3.176	0.007
	VOLCO41 does not Granger Cause RETURNCO41	1.104	0.356
co42	RETURNCO42 does not Granger Cause VOLCO42*	2.279	0.045
	VOLCO42 does not Granger Cause RETURNCO42	1.422	0.214
co43	RETURNCO43 does not Granger Cause VOLCO43*	3.668	0.003
	VOLCO43 does not Granger Cause RETURNCO43	1.096	0.361
co44	RETURNCO44 does not Granger Cause VOLCO44*	6.428	0.000
	VOLCO44 does not Granger Cause RETURNCO44*	3.791	0.002
co45	RETURNCO45 does not Granger Cause VOLCO45*	4.940	0.000
	VOLCO45 does not Granger Cause RETURNCO45	1.725	0.126
co46	RETURNCO46 does not Granger Cause VOLCO46*	8.690	0.000
	VOLCO46 does not Granger Cause RETURNCO46*	2.224	0.050
co47	RETURNCO47 does not Granger Cause VOLCO47*	2.014	0.074
	VOLCO47 does not Granger Cause RETURNCO47	0.945	0.451
co48	RETURNCO48 does not Granger Cause VOLCO48*	9.526	0.000
	VOLCO48 does not Granger Cause RETURNCO48*	2.682	0.020
co49	RETURNCO49 does not Granger Cause VOLCO49*	4.027	0.001
	VOLCO49 does not Granger Cause RETURNCO49*	2.495	0.029
co50	RETURNCO50 does not Granger Cause VOLCO50*	6.708	0.000
	VOLCO50 does not Granger Cause RETURNCO50	0.991	0.422
co51	RETURNCO51 does not Granger Cause VOLCO51	0.697	0.625
	VOLCO51 does not Granger Cause RETURNCO51*	3.034	0.010
co52	RETURNCO52 does not Granger Cause VOLCO52	1.836	0.103
	VOLCO52 does not Granger Cause RETURNCO52	0.663	0.652
co53	RETURNCO53 does not Granger Cause VOLCO53*	8.269	0.000
	VOLCO53 does not Granger Cause RETURNCO53*	3.162	0.008
co54	RETURNCO54 does not Granger Cause VOLCO54*	2.389	0.036
	VOLCO54 does not Granger Cause RETURNCO54*	1.588	0.160

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:Ŏǿŏ ǤǆŁ (Granger Causality test) ǋƑǤǈ ƘǈǤŁĂ

ŀǒŀƮ ŀpŭƵ ǁǤǈǋ ǈǋ (đ-đ) ǅpƧ ƽơŭ!ƒ ýĂƥŋ!ƒ Ŏ5 ǑǋŊ ǤǆŁ ƧǤƘƤŰƒ ǋƑǤǈ ƘƧǌUǋ .č

ǇƘƮùǈ ǤǆƮ đĐ ýƮǋ ǈǆ ŁŁƧT ĎĐ Ŏ5 %đ ŀǒĂǈƶǆ ăĂƘƮǆ ƥǈƵ ŀǒƑǤƮơ ŀ!Űƥ ƘƒƦ

[illegible]

[illegible]

[illegible] Mahajan and Singh (2008) [illegible]

[illegible] National Stock Exchange (NSE) [illegible]

[illegible] Nor and Cheong (2007) [illegible]

(đ-đ) ǻǼƧ ýǍþɳ

(Granger Cuaslity test)

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	Null Hypothesis:	F-Statistic	Probability ≥ 0.05
co1	VOTCO1 does not Granger Cause VOLCO1	0.849	0.515
	VOLCO1 does not Granger Cause VOTCO1*	8.286	0.000
co2	VOTCO2 does not Granger Cause VOLCO2	0.492	0.782
	VOLCO2 does not Granger Cause VOTCO2	1.001	0.416
co3	VOTCO3 does not Granger Cause VOLCO3	0.808	0.544
	VOLCO3 does not Granger Cause VOTCO3	1.176	0.319
co4	VOTCO4 does not Granger Cause VOLCO4	2.326	0.041
	VOLCO4 does not Granger Cause VOTCO4	1.341	0.244
co5	VOTCO5 does not Granger Cause VOLCO5	0.234	0.948
	VOLCO5 does not Granger Cause VOTCO5	1.286	0.267
co6	VOTCO6 does not Granger Cause VOLCO6	0.866	0.503
	VOLCO6 does not Granger Cause VOTCO6	0.834	0.525
co7	VOTCO7 does not Granger Cause VOLCO7	1.171	0.321
	VOLCO7 does not Granger Cause VOTCO7	0.765	0.575
co8	VOTCO8 does not Granger Cause VOLCO8	0.068	0.997
	VOLCO8 does not Granger Cause VOTCO8	1.038	0.394
co9	VOTCO9 does not Granger Cause VOLCO9	0.588	0.710
	VOLCO9 does not Granger Cause VOTCO9	1.747	0.121
co10	VOTCO10 does not Granger Cause VOLCO10	0.214	0.957
	VOLCO10 does not Granger Cause VOTCO10	0.897	0.482
co11	VOTCO11 does not Granger Cause VOLCO11	1.313	0.258
	VOLCO11 does not Granger Cause VOTCO11	1.811	0.110
co12	VOTCO12 does not Granger Cause VOLCO12*	2.451	0.032
	VOLCO12 does not Granger Cause VOTCO12*	5.550	0.000
co13	VOTCO13 does not Granger Cause VOLCO13	1.249	0.285
	VOLCO13 does not Granger Cause VOTCO13	0.913	0.473
co14	VOTCO14 does not Granger Cause VOLCO14	0.208	0.959
	VOLCO14 does not Granger Cause VOTCO14	1.914	0.089
co15	VOTCO15 does not Granger Cause VOLCO15	0.696	0.627
	VOLCO15 does not Granger Cause VOTCO15	0.529	0.754
co16	VOTCO16 does not Granger Cause VOLCO16	0.851	0.514
	VOLCO16 does not Granger Cause VOTCO16*	2.564	0.026
co17	VOTCO17 does not Granger Cause VOLCO17	0.630	0.677
	VOLCO17 does not Granger Cause VOTCO17*	2.398	0.036
co18	VOTCO18 does not Granger Cause VOLCO18*	2.223	0.051
	VOLCO18 does not Granger Cause VOTCO18	1.110	0.354

	Null Hypothesis:	F-Statistic	Probability ≥ 0.05
co19	VOTCO19 does not Granger Cause VOLCO19	2.174	0.055
	VOLCO19 does not Granger Cause VOTCO19	0.467	0.801
co20	VOTCO20 does not Granger Cause VOLCO20	1.107	0.356
	VOLCO20 does not Granger Cause VOTCO20	0.661	0.653
co21	VOTCO21 does not Granger Cause VOLCO21	0.335	0.892
	VOLCO21 does not Granger Cause VOTCO21	1.521	0.181
co22	VOTCO22 does not Granger Cause VOLCO22	1.679	0.136
	VOLCO22 does not Granger Cause VOTCO22*	2.512	0.028
co23	VOTCO23 does not Granger Cause VOLCO23*	3.406	0.005
	VOLCO23 does not Granger Cause VOTCO23	1.147	0.334
co24	VOTCO24 does not Granger Cause VOLCO24	1.254	0.282
	VOLCO24 does not Granger Cause VOTCO24	0.241	0.944
co25	VOTCO25 does not Granger Cause VOLCO25	1.597	0.158
	VOLCO25 does not Granger Cause VOTCO25	1.229	0.293
co26	VOTCO26 does not Granger Cause VOLCO26	0.461	0.805
	VOLCO26 does not Granger Cause VOTCO26	1.444	0.205
co27	VOTCO27 does not Granger Cause VOLCO27*	3.796	0.002
	VOLCO27 does not Granger Cause VOTCO27	1.613	0.154
co28	VOTCO28 does not Granger Cause VOLCO28*	5.128	0.000
	VOLCO28 does not Granger Cause VOTCO28	0.457	0.809
co29	VOTCO29 does not Granger Cause VOLCO29	1.014	0.408
	VOLCO29 does not Granger Cause VOTCO29	1.100	0.359
co30	VOTCO30 does not Granger Cause VOLCO30*	2.331	0.040
	VOLCO30 does not Granger Cause VOTCO30	0.831	0.527
co31	VOTCO31 does not Granger Cause VOLCO31	1.177	0.319
	VOLCO31 does not Granger Cause VOTCO31	0.582	0.714
co32	VOTCO32 does not Granger Cause VOLCO32*	2.333	0.040
	VOLCO32 does not Granger Cause VOTCO32	0.868	0.502
co33	VOTCO33 does not Granger Cause VOLCO33*	4.373	0.001
	VOLCO33 does not Granger Cause VOTCO33	1.405	0.220
co34	VOTCO34 does not Granger Cause VOLCO34*	2.990	0.011
	VOLCO34 does not Granger Cause VOTCO34*	2.254	0.047
co35	VOTCO35 does not Granger Cause VOLCO35	1.014	0.408
	VOLCO35 does not Granger Cause VOTCO35	0.848	0.515
co36	VOTCO36 does not Granger Cause VOLCO36	1.806	0.109
	VOLCO36 does not Granger Cause VOTCO36	1.058	0.382
co37	VOTCO37 does not Granger Cause VOLCO37	0.530	0.754
	VOLCO37 does not Granger Cause VOTCO37	0.945	0.451
co38	VOTCO38 does not Granger Cause VOLCO38*	8.651	0.000
	VOLCO38 does not Granger Cause VOTCO38*	5.785	0.000

	Null Hypothesis:	F-Statistic	Probability ≥ 0.05
co39	VOTCO39 does not Granger Cause VOLCO39*	2.354	0.039
	VOLCO39 does not Granger Cause VOTCO39	0.041	0.999
co40	VOTCO40 does not Granger Cause VOLCO40	2.016	0.074
	VOLCO40 does not Granger Cause VOTCO40*	3.484	0.004
co41	VOTCO41 does not Granger Cause VOLCO41*	5.574	0.000
	VOLCO41 does not Granger Cause VOTCO41	0.976	0.431
co42	VOTCO42 does not Granger Cause VOLCO42*	5.272	0.000
	VOLCO42 does not Granger Cause VOTCO42*	3.968	0.001
co43	VOTCO43 does not Granger Cause VOLCO43	2.022	0.073
	VOLCO43 does not Granger Cause VOTCO43	2.011	0.074
co44	VOTCO44 does not Granger Cause VOLCO44*	2.907	0.013
	VOLCO44 does not Granger Cause VOTCO44	0.416	0.838
co45	VOTCO45 does not Granger Cause VOLCO45	0.949	0.449
	VOLCO45 does not Granger Cause VOTCO45*	2.270	0.046
co46	VOTCO46 does not Granger Cause VOLCO46*	3.053	0.010
	VOLCO46 does not Granger Cause VOTCO46*	3.006	0.010
co47	VOTCO47 does not Granger Cause VOLCO47	0.501	0.776
	VOLCO47 does not Granger Cause VOTCO47	1.061	0.381
co48	VOTCO48 does not Granger Cause VOLCO48*	5.283	0.000
	VOLCO48 does not Granger Cause VOTCO48	0.850	0.514
co49	VOTCO49 does not Granger Cause VOLCO49*	3.279	0.006
	VOLCO49 does not Granger Cause VOTCO49*	5.900	0.000
co50	VOTCO50 does not Granger Cause VOLCO50*	5.627	0.000
	VOLCO50 does not Granger Cause VOTCO50	1.200	0.307
co51	VOTCO51 does not Granger Cause VOLCO51*	2.838	0.015
	VOLCO51 does not Granger Cause VOTCO51*	3.506	0.004
co52	VOTCO52 does not Granger Cause VOLCO52	0.961	0.441
	VOLCO52 does not Granger Cause VOTCO52*	3.978	0.001
co53	VOTCO53 does not Granger Cause VOLCO53*	4.474	0.000
	VOLCO53 does not Granger Cause VOTCO53*	3.862	0.002
co54	VOTCO54 does not Granger Cause VOLCO54*	3.093	0.009
	VOLCO54 does not Granger Cause VOTCO54	0.869	0.501

ł ơǤǖ!ƒ ƥƒƥƵƍ Ǉǆǆ ƨƥƮǆ!ƒ

(VEC) Vector Error Correction Model þƑƓƗƜǁ Ď- č- Đ

ýùηŰƒ ƧŏƮùǃ!ƒ ăþdž!ƒ Ǐ ǁƵ ƗŏǂǒdžǤǉǒþ!ƒ ƗpŭƸ!ƒ ƧǤǆƘƤŬ ƜƦĂdžǉ!ƒ ƒƦǊ ǅƒþƤƘǈƒ ǅƘ þpĂ

ǇǒǀǅǤùǈ ýĂƒþƘ ŎdžĂŏ ýŭùùƤ ǇdžǅþƑƒĂƸ!ƒ ƘǤǆǁǀƘĂ ǅǌǈŰƒ þƑƒĂƵ ǇdžǅŭǂĂ ýĂƒþƘ!ƒ ǅηơ ǇǒǅǆǅǅǤ

:Ŏǁǒ ǤdžǂǅƝƑǤǉǉ!ƒ ƘǉǤǂĂ (t-1,t-2)

:ǅǌǈŰƒ þƑƒĂƵĂ ýĂƒþƘ!ƒ ǅηơ ǇǒǅǆƗŏǂǒdžǤǉǒþ!ƒ Ɨpŭƶ!ƒ - č

.(Ē- đ) ǅþƧ ýĂþη!ƒ Ŏ5 ŎǊ ǤdžǂǅǅǤ

VOL-) Ŏ!Ǥơ!ƒ ǅĂŏǁ! ýĂƒþƘ!ƒ ǅηơĂ ƪǅǤǈ!ƒ ǅĂŏ!ƒ ýĂƒþƘ ǅηơ ǇǒǅƗŏǂǒdžǤǉǒþ!ƒ Ɨpŭƶ!ƒ - Ď

.(1 and VOL

Ɨù!Ŭþ ƘƒƦ ýùηŰƒ ǀƧŏƮùp Ɨŏǂǒdž ǤǉǒþƗpŭƵ þĂηĂ (VEC) ƧǤǆƘƤƒ ƝƑǤǉǉ ƘƧǌƲƊ

ƗùǉǒƵ ƘǤǂƧƬ!ƒ ýǒdžη Ŏ5 Ŏ!Ǥơ!ƒ ǅĂŏ!ƒ ýĂƒþƘ ǅηơĂ ƪǅǤǈ!ƒ ǅĂŏ!ƒ ýĂƒþƘ ǅηơ ǇǒǅǤdžƗǒƑǤƮơǫ

ùù!ƒ ƘǤǂƧƬ!ƒ ýǒdžη Ŏ5 (t-statistic) ùǁ! ƗǁǁƱdž!ƒ Ɨdžǒǀ!ƒ ǇǅƗǒơ Ü%čČČ ƗǅǈǉǅĂ ƗǈƒƧþ!ƒ

ýǒdžη Ŏ5 Ɨǒǅǁǈ ƘǉǤǂ Ɨpŭƶ!ƒ ǉƦǊ ǇǤ5 ǁ!Ʀ Ǐ!ǫ Ɨ5ǤƯŮǤǅ Ü(Ď,đ) ǐĂǤǈŏ ĂǅƧǅǂƒ ƘǉǤǂ (đĐ)

.ƘǤǂƧƬ!ƒ

ǅĂùŏ!ƒ ýĂƒþùƘ ǅηơ ǀþǤŏƨ Ǐ!ǫ ǐþƋŏ ƪǅǤǈ!ƒ ǅĂŏ!ƒ ýĂƒþƘ ǅηơ ƯǤƽƤǉƒ ǇǅŎǉƶŏ ƒƦǊĂ

.ƠŏơƮ Ʃǂƶ!ƒĂ Ŏ!Ǥơ!ƒ

VOL-) ǇǒdžĂŏ ýǅp ǤdžýĂƒþƘ ǅηơĂ Ŏ!Ǥơ!ƒ ǅĂŏ!ƒ ýĂƒþƘ ǅηơĂ ǇǒǅǆƗŏǂǒdžǤǉǒþ!ƒ Ɨpŭƶ!ƒ - Ɣ

.(2 and VOL

Ɨù!Ŭþ ƘƒƦ ýùηŰƒ ǀƧŏƮp Ɨŏǂǒdž ǤǉǒþƗpŭƵ ǁǤǉǊ Ǉǅ (VEC) ƧǤǆƘƤƒ ƝƑǤǉǉ ƘƧǌƲƊ

ƗùǉǒƵ ƘǤǂƧƬ ýǒdžη Ŏ5 Ŏ!Ǥơ!ƒ ǅĂŏ!ƒ ýĂƒþƘ ǅηơĂ ǇǒdžĂŏ ýǅp Ǥdž ýĂƒþƘ ǅηơ ǇǒǅǤdž ƗǒƑǤƮơǫ

ùù!ƒ ƘǤǂƧƬ!ƒ ýǒdžη Ŏ5 (t-statistic) ùǁ! ƗǁǁƱdž!ƒ Ɨdžǒǀ!ƒ ǇǅƗǒơ Ü%čČČ ƗǅǈǉǅĂ ƗǈƒƧþ!ƒ

ƴōdžɳ Ŏ5 ǂōhǘǐ Ƙǖǐǂ ǂpǚz!ƒ ǰǨǋ ǇǕ5 ǁ!Ʀ Ĭ!ǫ ǂ5ǘưǗǘ Ü(Ď,đ) ĭĂǘǐō ĂD Ƨǂƒ Ƙǖǐǂ (đĐ)

.ƘǗǂƧT!ƒ

ƕøɀűY ƿƑødžǉ) ǂùō!ǘk!ƒ ǂǚōƥǘ!ƒ ǂōưƧɀ!ƒ ýĂƕp Džkōǐ (Ɣ Ü D) Ŏ5 Džƥlk Ǘdž Ĭǁ Ƶ ƒǘǕǰƕĂ

ƘǗǂƧùT ƴùōdžɳ! (5ǘƑƨǁ ǖǋɛɋǂǁ !ɯΘ ǋ ĬǁƑΘǁ ǖǋɛɋǂǁ !ɯΘ DžĭǗ ǖɯǕɛ ƴƥĭTɀ ƕĭǀĭDžƑdžĭɋ

.ǂǰōz!ƒ

DžĂùō!ƒ ýĂƒƥùk Džɳơ YǗɀkƧƒ Ĭ!ǫ ĭƥƌō ǇōdžĂō ýƕp Ǘdž ýĂƒƥk Džɳơ ƯǗɀƤǉƒ ǇǕ5 ǂōǁƵĂ

ýĂƒƥùk!ƒ DžǗùɳơD Ĭ!ǫ YĂɳƧ!ƒ ýǚƤ ǇJdž ŎǚǀkǐǊ!ƒ ýĂƒƥk!ƒ Džɳơƕ ǨĂƕk!ƒ ǇǂDžō ǂōơƕ ÜŎ!ǘơ!ƒ

ƽĂùǐ Ƙùǐ Ƨƥ Ŏk!ƒĂ Lu and Lin (2010)ǂǐƒƧƥ ǋƑǘkǉ ƥǂƌk! ǋƑǘkǉ!ƒ ǰǨǋ ƘǗǘɳĂ ÜǂǀhǗǐ!ƒ

Ŏ5 ƒƧōƕǂ ƒƧōƛƌk ƧƛƌK ǂǀhǗǐ!ƒ ƘǗǚǀk!ƒĂ ýĂƒƥk!ƒ DžǗɳơD ǇD Ƙƥɳ Ă Ŏk!ƒĂ ǂō!Ǘdž!ƒ ƽƒƧĂǖ! ǇƒĂōǗk

.ǂō!Ǘơ!ƒ ƥƑƒĂz!ƒ ƘǗǚǀkĂ ýĂƒƥk!ƒ DžǗɳơD

ƽhǗǐù!ƒ DžĂùō!ƒ Džǌùǐ D ƥùƑƒĂƵĂ Ŏ!Ǘùơ!ƒ DžĂō!ƒ ýĂƒƥk DžɳơĂ ǇōƕǂōdžǗǰōƥ!ƒ ǂpǚz!ƒ - Ƙ

.(Return-1 and VOL)

ƥùƑƒĂƵ ǇōƕýɳǕƒ ǀƧōƮp ǂōǂōdžǗǰōƥ ǂpǚƵ ƥɳĂō Ǘ ǋǉƒ (VEC) ƧǗhƤƒ ǋƑǘkǉ ƘƧǌƱD

Ʊùǀ5 ǂōƑǗƮơǫ ǂ!Ǘƥ ĂƦ Ƙǖǐǂ ǂpǚz!ƒ ǰǨǋ ǇD ǂōơ ÜŎ!Ǘơ!ƒ DžĂō!ƒ ýĂƒƥk Džɳơ Ă ƽhǗǐ!ƒ DžĂō!ƒ

ùùǁ! ǂùǀǁƱdž!ƒ ǂdžōǀ!ƒ ǇD ǂùùōơ Üǂùǐƒƥ!ƒ ǂùǰōƵ ǇùDž %ĕ ǋkƕǐǉ Ǘdžƕ ĭD ƘǗǂƧT đ Ŏ5

Ǘùǌƶōdžɳ ƘǗǂƧTù!ƒ ǰǨùǋĂ Ʊǀ5 ƘǗǂƧT (đ) Ŏ5 (Ď,đ) ĭĂǘǐō ĂD Ƨǂƒ Ƙǖǐǂ (t-statistic)

.ǂōhǘǐ Ǘǌō5 ǂpǚz!ƒ Ƙǖǐǂ

ǇōdžĂùō ýùƕp Ǘùdž Džǌùǐ D ƥùƑƒĂƵĂ Ŏ!Ǘơ!ƒ DžĂō!ƒ ýĂƒƥk Džɳơ ǇōƕǂōdžǗǰōƥ!ƒ ǂpǚz!ƒ - ǂ

.(Return-2 and VOL)

ƥùƑƒĂƵ ǋǅŏƞ ýƞǕƒ ƖƧŏƬƿ Ƀŏǂŏďž ǌǉŏƥ Ƀƿǖƶ ƥƞĂŏ Ǖ ǈǉƒ (VEC) ƨǅƙƤƒ ƝƑǅǋǉ ƘƧǌƱƊ

Ƚù!Ǘƥ ĂƦ Ƙù ǉǅǂ Ƚùƿǖƶ!ƒ ǉƦùǋ ǋǅƊ Ƚ ŏơ ÜŎ!ǅơ!ƒ ďĂŏ!ƒ ýĂƒƥƙ ďƞơ Ă ǋǅŏďžĂŏ ýƞƿ ǅďž! ďǌǋƪǕƒ

Ƚù ǀƱďž!ƒ Ƚùďžŏǀ!ƒ ǋǅƊ Ƚ ŏơ ÜȽƪƒƧƥ!ƒ Ƚǉŏƶ ǋǅďž %ě ǈǉƙƞƪǉ ǅďžƞ ĭ Ɗ Ƙǅǂ ƧƬ đ Ŏ5 Ʊǀ5 ȽŏƑǅƬơƪ

Ƚùƿǖƶ!ƒ ǉƦùǋ Ƙǉǅǂ Ă ÜƱǀ5 Ƙǅǂ ƧƬ (đ) Ŏ5 (Ď,đ) ĭ Ăǅƪŏ ĂƊ Ƨƞǂƒ Ƙǉǅǂ (t-statistic) ù ǀ!

.%ĎČ ǈǉƙƞƪǉ ǅďžƞ ƖƥơƒĂ ȽǂƧƬ Ŏ5 Ƚŏƞǀƪ Ă %ĚČ ǈǉƙƞƪǉ ǅďžƞ Ƙǅǂ ƧƬ (Đ) Ŏ5 ȽŏƞǅƞŏƒƑ

ƿƑďžǉ) Ƚŏ!ǅƙ!ƒ Ƚǀŏƥƞ!ƒ Ƚŏ ư Ƨƽ!ƒ Ư 5Ƨ ďžŏƪ (Ƚ ÜƘ) ǋǅŏƙƧǀƽ!ƒ Ŏ5 ďžƥǀƙ ǅďž Ĭ ǀƵ ƒǅǅǉƞĂ

ƣǝƐǊƳǊ Ĭ ǁƑƟǁƐ üǊƐƣȽǁƐ !ƜƟ ďžĭǅ ƞĭǝƑƬƟǝ ƞǁǗƣ ǀ ƐƤ üƜǗƐ ƴƥĭƬƽ ƞĭ ǀ ĭďžƑďžĭƣ ƞƽǘƳ

.(ƞƾǅƑ ƨ ǁƐ !ǈ ƨ ǕƐ)

VOL-1) ƾƞǅƪ!ƒ ďĂŏ!ƒ ýĂƒƥƙ ďƞơĂ Ŏ!ǅơ!ƒ ďĂŏ!ƒ ďǌǋƪƊ ƥƑƒĂƵ ǋǅŏƞ Ƚŏǂŏďž ǌǉŏƥ!ƒ Ƚƿǖƶ!ƒ -Ɯ

.(and Return

Ƚù!Ǘƥ Ƙƒ Ʀ ýƞǕƒ ƖƧŏƬƿ Ƚŏǂŏďž ǌǉŏƥ Ƚƿǖƶ ƥƞĂŏ Ǖ ǈǉƊ (VEC) ƨǅƙƤƒ ƝƑǅǋǉ ƘƧǌƱƊ

Ƚ!Ǘƥ Ƙƒ Ʀ Ƚƿǖƶ!ƒ ǉƦǋ ǋǅƊ Ƚ ŏơ ÜƾƞǅƪǄ!ƒ ďĂŏ!ƒ ýĂƒƥƙ ďƞơĂ Ƚŏ!ǅơ!ƒ ďǌǋƪǕƒ ƥƑƒĂƵ ǋǅŏƞ ȽŏƑǅƬơƪ

Ŏ5 ȽƞƞĂďž Ƚƿǖƶ!ƒ ǉƦǋ Ƙǉǅǂ Ă ÜȽǉŏƶ!ƒ ďƞơ ǋǅďž %ē ǈǉƙƞƪǉ ǅďžƞ Ʊǀ5 Ƙǅǂ ƧƬ (Đ) Ŏ5 ȽŏƑǅƬơƪ

Ƚùƿǖƶ!ƒ ǋǅƊ Ƚ ùŏơ Ü %ēđ ǈǉƙƞƪǉ ǅďžƞ Ƙǅǂ ƧƬ (ď) Ŏ5 Ƚŏƞǀƪ Ă %Ďđ ǈǉƙƞƪǉ ǅďžƞ ƖƥơƒĂ ȽǂƧƬ

.(Ď,đ) ĭ Ăǅƪƙ ĂƊ Ƨƞǂƒ Ƚǀ Ʊďž!ƒ (t-statistic) Ƚďžŏƿ ǋĂǂƙ ǅďžƥǉƵ ȽŏƑǅƬơƪ Ƚ!Ǘƥ Ƙƒ Ʀ ǋĂǂƙ

VOL-) ǋǅŏďžĂùŏ ýƞƿ ǅďž ýĂƒƥƙ ďƞơĂ Ŏ!ǅơ!ƒ ďĂŏ!ƒ ďǌǋƪƊ ƥƑƒĂƵ ǋǅŏƞ Ƚŏǂŏďž ǌǉŏƥ!ƒ Ƚƿǖƶ!ƒ -Ɵ

.(2 and Return

Ƚù!Ǘƥ Ƙƒ Ʀ ýƞǕƒ ƖƧŏƬƿ Ƚŏǂŏďž ǌǉŏƥ Ƚƿǖƶ ƥƞĂŏ Ǖ ǈǉƊ (VEC) ƨǅƙƤƒ ƝƑǅǋǉ ƘƧǌƱƊ

Ƙƒ Ʀ Ƚùƿǖƶ!ƒ ǉƦùǋ ǋǅƊ Ƚ ŏơ ÜǋǅŏďžĂŏ ýƞƿ ǅďž ýĂƒƥƙ ďƞơĂ Ƚŏ!ǅơ!ƒ ďǌǋƪǕƒ ƥƑƒĂƵ ǋǅŏƞ ȽŏƑǅƬơƪ

ŀùŵŋĂdž ŀùpǖž!ƒ ǉŖǋ ƘǇǤŧĂ ÜĿǇöž!ƒ Džŋơ ǇǊdž %Đ ǋǨŵƪǉ Ǥdžŵ Ʊǀ5 ǇǊöƘŧƧƬ Ŏ5 ŀöƑǤƬơǫ ŀ!Ǖþ

(t- ŀùdžöp ǇĂù ŧƘ Ǥdžþù ǇƵ ŀöƑǤƬùơǫ ŀù!Ǖþ ƘƒŖ ǇĂŧƘ ŀpǖž!ƒ ǇĐ ŀöơ ÜǇöƘŧƧƬ!ƒ Ǥǩǀŧ Ŏ5

.(Ď,đ) ĭĂǤƪƘ ĂĐ Ƨŵŧƒ ŀǀǀƱdž!ƒ statistic)

pƑødžǉ) ŀùö!Ǥǩ!ƒ ŀǀöþŵ!ƒ ŀöƯƧƽ!ƒ Ư5Ƨ Džǩöƪ (Θ Üǀǀ) ǇǊöƘƧǀƽ!ƒ Ŏ5 Džþǀƙ Ǥdž Ĭǀǀ Ƶ ƒǤǤǇŵĂ

üǋƐǭøĿǁƐ !ǀǀǀΘǋ ŵĭǁƑΘǁƐ !ǋƨǕƐ ǭƏƐǋY Džĭǀǀ Ǥ ŵĭƏƑƬΘǀǀ ŵǁǖǭ ǀƐP üǀǀǀǕƐ ƔþĭƬƼ ŵĭǀĭĐǰƑdžĭǭ ŵƼǘY

.(5ǤƑƨǁƐ

ƽĂùƪ ĬùǀǀƵ ƘùŏƧŋĐ ŎǨ!ƒĂ Mubarik and Javid (2009) ŀƪƒƧþ ƘþŋĂ Ǥdžǉöŵ

.Ŏ!Ǥùơ!ƒ ǋĂùö!ƒ þùƑƒĂƵ Ĭùǀǀ Ƶ ƽŵǤƪ!ƒ ýĂƒþǩ!ƒ Džŋơ! Ƨöŵŧ!ƒ ƧöǉdžǨ!ƒ ĬǀǀƵ ǤöĂp ǖö!þ ǇǤǩƪŧǤŵ!ƒ

(ŀö!Ǥdž!ƒ ƽƒƧĂǖ! ǇǊöƱƪǀǀ5) ƽĂƪ ĬǀǀƵ ƘöƧŋĐ ŎǨ!ƒĂ Darwish (2011) ŀƪƒƧþ Ĭ!ǫ ŀ5ǤƯǗǤŵ

ýǖùP ǇǊdž ǄĂŵǨ!ƒ ǇŧdžöǋǇƒĂ ÜþƑƒĂž!ƒĂ ýĂƒþǩ!ƒ Džŋơ ǇǊöŵ ǀƧƬǤždž ŀöŵǤŋöƒ ŀpǖƵ ƘþŋĂ ŀöơ

.ýŵǀƘƪdž!ƒ Ŏ5 þƑƒĂž!ƒ Džŋơŵ ýĂƒþǩ!ƒ Džŋơ

Return-) ƽŵǤƪ!ƒ DžĂö!ƒ ǋǌƪĐ þƑƒĂƵĂ Ŏ!Ǥơ!ƒ DžĂö!ƒ ǋǌƪĐ þƑƒĂƵ ǇǊöŵ ŀöŧödžǤǇöþ!ƒ ŀpǖž!ƒ -ǭ

.(1 and Return

ŀù!Ǖþ ƘƒŖ ýŋǕƒ ǀƧöƬp ŀöŧödžǤǇöþ ŀpǖƵ þŋĂö Ǖ ǋǇĐ (VEC) ƧǤŵƘPƒ ǋƑǤǩǉ ƘƧǌƲĐ

ŀ!Ǖþ ƘƒŖ ŀpǖž!ƒ ǉŖǋ ǇĐ ŀöơ ÜƽŵǤƪ!ƒ DžĂö!ƒ ǋǌƪĐ þƑƒĂƵĂ ŀö!Ǥơ!ƒ ǋǌƪǕƒ þƑƒĂƵ ǇǊöŵ ŀöƑǤƬơǫ

(ē) ŀùŵŋĂdž ŀpǖž!ƒ ǉŖǋ ƘǇǤŧĂ ÜĿǇöž!ƒ Džŋơ ǇǊdž %čě ǋǨŵƪǉ Ǥdžŵ ƘǤŧƧƬ (čČ) Ŏ5 ŀöƑǤƬơǫ

ǇĂù ŧƘ ŀùpǖž!ƒ ǇĐ ŀöơ Ü%ďČ ǋǨŵƪǉ Ǥdžŵ ƘǤŧƧƬ (ď) Ŏ5 ŀŵ!ǤƪĂ %ēČ ǋǨŵƪǉ Ǥdžŵ ƘǤŧƧƬ

.(Ď,đ) ĭĂǤƪƘ ĂĐ Ƨŵŧƒ ŀǀǀƱdž!ƒ (t-statistic) ŀdžöp ǇĂŧƘ ǤdžþǉƵ ŀöƑǤƬơǫ ŀ!Ǖþ ƘƒŖ

ǇöǉĂùö ýùŵp Ǥùdž! ǋǌùƪǕƒ þƑƒĂƵĂ Ŏ!Ǥơ!ƒ DžĂö!ƒ ǋǌƪĐ þƑƒĂƵ ǇǊöŵ ŀöŧödžǤǇöþ!ƒ ŀpǖž!ƒ -þ

.(Return-2 and Return)

Ŧù!Ǚþ ƘƒƦ ýɳǕƒ ƖƧŏƮp Ŧŏŧŏdžǁǉŏþ ŦpǘƵ þɳĂŏ Ǚ ǊǇǅ (VEC) ƧǁǈƤƒ ǋƑǁǉ ƘƧǌǛǅ

ƘƒƦ ŦùpǘǌƵ!ƒ ǉƦǋ Ǉǅ Ŧŏơ ǛǇŏdžĂŏ ýǃp ǁdž! ǅǌƪǕƒ þƑƒĂƵĂ Ŧŏ!ǁơ!ƒ ǅǌƪǕƒ þƑƒĂƵ ǇŏǃŦŏƑǁƮơƍ

ŦùǃɳĂdž ŦpǘƵ!ƒ ǉƦǋ ƘǉǁŧĂ ǛŦǉŏƵ!ƒ ǅɳơ ǇdžǅЌ %čē ǊǈǃƪǉǁdžǃƘǁŧƧT (ĕ) Ŏ5 ŦŏƑǁƮơƍ Ŧ!Ǚþ

ŦùpǘƵ!ƒ ǇǅŦŏơ Ǜ%ĐĐ ǊǈǃƪǉǁdžǃƘǁŧƧT (Đ) Ŏ5 Ŧǃ!ǁƪĂ %đĒ ǊǈǃƪǉǁdžǃƘǁŧƧT (đ) Ŏ5

.(Ď,đ) ĭĂǁƪƙ ĂǅƧǃŧƒ ŦǀƱdž!ƒ (t-statistic) Ŧdžŏp ǇĂŧƙ ǁdžþǉƵ ŦŏƑǁƮơƍ Ŧ!Ǚþ ƘƒƦ ǇĂŧƙ

pƑødžǉ) Ŧùŏ!ǁƙ!ƒ Ŧǀŏþǃ!ƒ ŦŏưƧ5!ƒ Ư5Ƨ ǅƙŏƪ (þ ǛǆǇ) ǇŏƙƧǀ5!ƒ Ŏ5 ǅþǀƙ ǁdž ĬǀƵ ƒǁǁǉǃĂ

!ǊƨǗƐ ơƏƐǋƳǋ ǃĭǁƑƟǁƐ !ǊƨǗƐ ơƏƐǋƳ ǅĭǁ ǃĭƏƑƬƟƏ ǃǁǗơ ƖƐƤ üǀǗƐ ƔþĭƬ5 ǃĭǀĭǅƑdžĭơ ǃ5űƳ

.(ǃƨǁƑƨǁƐ

(Ē-đ) ǅǷƨ ýĂþƞ!ƒ

(Vector Error Corection Model)

ǅǌǃŰƒ þƑƒĂƵĂ ýĂƒþķ!ƒ ǅƞơ Ǉǒǖ ŧǒǂǒǆǈǉǒþ!ƒ ŧþǖƶ!ƒ

	Error Correction:	D(VOL)	D (RETURN)		Error Correction:	D(VOL)	D (RETURN)
co1	D(VOLCO1(-1))	-0.542*	0.000	**co8**	D(VOLCO8(-1))	-0.575*	0.001
	D(VOLCO1(-2))	-0.226*	-0.001		D(VOLCO8(-2))	-0.247*	0.001
	D(RETURNCO1(-1))	0.384	0.019		D(RETURNCO8(-1))	1.983	0.043
	D(RETURNCO1(-2))	0.897	0.030		D(RETURNCO8(-2))	1.500	-0.027
co2	D(VOLCO2(-1))	-0.546*	0.001	**co9**	D(VOLCO9(-1))	-0.599*	-0.001
	D(VOLCO2(-2))	-0.266*	0.001		D(VOLCO9(-2))	-0.328*	-0.001
	D(RETURNCO2(-1))	1.770	0.089*		D(RETURNCO9(-1))	0.332	-0.009
	D(RETURNCO2(-2))	0.677	0.050		D(RETURNCO9(-2))	0.905	-0.052
co3	D(VOLCO3(-1))	-0.638*	0.000	**co10**	D(VOLCO10(-1))	-0.524*	0.003
	D(VOLCO3(-2))	-0.259*	0.001		D(VOLCO10(-2))	-0.284*	0.000
	D(RETURNCO3(-1))	0.049	-0.086		D(RETURNCO10(-1))	-0.015	0.033
	D(RETURNCO3(-2))	-0.493	-0.021		D(RETURNCO10(-2))	0.047	0.002
co4	D(VOLCO4(-1))	-0.554*	0.000	**co11**	D(VOLCO11(-1))	-0.664*	0.000
	D(VOLCO4(-2))	-0.265*	0.002		D(VOLCO11(-2))	-0.318*	-0.001
	D(RETURNCO4(-1))	-0.203	0.047		D(RETURNCO11(-1))	-0.141	0.003
	D(RETURNCO4(-2))	0.502	0.008		D(RETURNCO11(-2))	1.263	0.001
co5	D(VOLCO5(-1))	-0.560*	0.001	**co12**	D(VOLCO12(-1))	-0.555*	0.000
	D(VOLCO5(-2))	-0.302*	0.001		D(VOLCO12(-2))	-0.264*	0.002
	D(RETURNCO5(-1))	1.092	0.041		D(RETURNCO12(-1))	0.756	0.051
	D(RETURNCO5(-2))	0.819	-0.030		D(RETURNCO12(-2))	0.113	0.004
co6	D(VOLCO6(-1))	-0.606*	0.001	**co13**	D(VOLCO13(-1))	-0.619*	-0.003*
	D(VOLCO6(-2))	-0.296*	0.002		D(VOLCO13(-2))	-0.247*	-0.001
	D(RETURNCO6(-1))	-0.926	0.126*		D(RETURNCO13(-1))	-2.100	0.044
	D(RETURNCO6(-2))	-1.177	0.060		D(RETURNCO13(-2))	-0.340	0.058
co7	D(VOLCO7(-1))	-0.542*	0.002	**co14**	D(VOLCO14(-1))	-0.572*	0.000
	D(VOLCO7(-2))	-0.300*	0.000		D(VOLCO14(-2))	-0.251*	0.001
	D(RETURNCO7(-1))	0.615	-0.062		D(RETURNCO14(-1))	2.077	0.027
	D(RETURNCO7(-2))	1.005	-0.051		D(RETURNCO14(-2))	1.844	0.018

	Error Correction:	D(VOL)	D (RETURN)		Error Correction:	D(VOL)	D (RETURN)
co15	D(VOLCO15(-1))	-0.545*	0.002	**co25**	D(VOLCO25(-1))	-0.566*	0.003
	D(VOLCO15(-2))	-0.277*	0.002		D(VOLCO25(-2))	-0.299*	0.001
	D(RETURNCO15(-1))	0.677	0.047		D(RETURNCO25(-1))	1.150*	-0.065
	D(RETURNCO15(-2))	0.886	0.017		D(RETURNCO25(-2))	0.501	-0.076*
co16	D(VOLCO16(-1))	-0.530*	0.002	**co26**	D(VOLCO26(-1))	-0.570*	-0.001
	D(VOLCO16(-2))	-0.291*	0.001		D(VOLCO26(-2))	-0.223*	-0.002
	D(RETURNCO16(-1))	0.871	-0.011		D(RETURNCO26(-1))	0.789	-0.099*
	D(RETURNCO16(-2))	0.161	-0.021		D(RETURNCO26(-2))	0.405	-0.086*
co17	D(VOLCO17(-1))	-0.519*	-0.002	**co27**	D(VOLCO27(-1))	-0.567*	0.001
	D(VOLCO17(-2))	-0.295*	0.000		D(VOLCO27(-2))	-0.256*	0.000
	D(RETURNCO17(-1))	-1.440	-0.093		D(RETURNCO27(-1))	0.165	-0.033
	D(RETURNCO17(-2))	-0.058	-0.046		D(RETURNCO27(-2))	1.004	-0.046
co18	D(VOLCO18(-1))	-0.558*	0.005*	**co28**	D(VOLCO28(-1))	-0.529*	0.000
	D(VOLCO18(-2))	-0.270*	0.002		D(VOLCO28(-2))	-0.274*	0.001
	D(RETURNCO18(-1))	4.100*	-0.026		D(RETURNCO28(-1))	0.423	0.092
	D(RETURNCO18(-2))	2.008	0.005		D(RETURNCO28(-2))	0.857	0.018
co19	D(VOLCO19(-1))	-0.524*	0.001	**co29**	D(VOLCO29(-1))	-0.514*	0.003
	D(VOLCO19(-2))	-0.200*	0.000		D(VOLCO29(-2))	-0.229*	0.000
	D(RETURNCO19(-1))	-2.238	-0.014		D(RETURNCO29(-1))	1.469	0.021
	D(RETURNCO19(-2))	-2.284*	0.013		D(RETURNCO29(-2))	0.749	0.000
co20	D(VOLCO20(-1))	-0.631*	0.001	**co30**	D(VOLCO30(-1))	-0.539*	0.001
	D(VOLCO20(-2))	-0.276*	0.003*		D(VOLCO30(-2))	-0.245*	0.001
	D(RETURNCO20(-1))	1.986	0.024		D(RETURNCO30(-1))	0.772	-0.072
	D(RETURNCO20(-2))	-1.003	0.053		D(RETURNCO30(-2))	0.373	-0.073*
co21	D(VOLCO21(-1))	-0.581*	-0.002	**co31**	D(VOLCO31(-1))	-0.626*	-0.001
	D(VOLCO21(-2))	-0.317*	-0.001		D(VOLCO31(-2))	-0.295*	0.001
	D(RETURNCO21(-1))	-0.192	-0.067		D(RETURNCO31(-1))	0.317	-0.058
	D(RETURNCO21(-2))	0.273	-0.038		D(RETURNCO31(-2))	0.023	-0.020
co22	D(VOLCO22(-1))	-0.543*	0.001	**co32**	D(VOLCO32(-1))	-0.516*	0.001
	D(VOLCO22(-2))	-0.224*	-0.001		D(VOLCO32(-2))	-0.257*	0.000
	D(RETURNCO22(-1))	2.847*	-0.047		D(RETURNCO32(-1))	1.622	-0.013
	D(RETURNCO22(-2))	1.161*	-0.044		D(RETURNCO32(-2))	0.964	-0.042
co23	D(VOLCO23(-1))	-0.529*	0.001	**co33**	D(VOLCO33(-1))	-0.536*	0.000
	D(VOLCO23(-2))	-0.255*	0.001		D(VOLCO33(-2))	-0.288*	0.000
	D(RETURNCO23(-1))	1.137	-0.061		D(RETURNCO33(-1))	1.524	0.024
	D(RETURNCO23(-2))	0.959	-0.038		D(RETURNCO33(-2))	2.859*	0.030
co24	D(VOLCO24(-1))	-0.488*	0.000	**co34**	D(VOLCO34(-1))	-0.547*	0.001
	D(VOLCO24(-2))	-0.274*	0.000		D(VOLCO34(-2))	-0.330*	0.002
	D(RETURNCO24(-1))	0.661	-0.059		D(RETURNCO34(-1))	0.702	0.024
	D(RETURNCO24(-2))	0.816	-0.057		D(RETURNCO34(-2))	0.653	-0.002

	Error Correction:	D(VOL)	D (RETURN)		Error Correction:	D(VOL)	D (RETURN)
co35	D(VOLCO35(-1))	-0.535*	-0.001	**co45**	D(VOLCO45(-1))	-0.504*	0.001
	D(VOLCO35(-2))	-0.256*	-0.002		D(VOLCO45(-2))	-0.282*	0.001
	D(RETURNCO35(-1))	1.615	0.011		D(RETURNCO45(-1))	-1.616	0.025
	D(RETURNCO35(-2))	1.216	0.052		D(RETURNCO45(-2))	-0.187	0.002
co36	D(VOLCO36(-1))	-0.595*	0.000	**co46**	D(VOLCO46(-1))	-0.526*	0.004
	D(VOLCO36(-2))	-0.287*	0.001		D(VOLCO46(-2))	-0.261*	0.002
	D(RETURNCO36(-1))	-1.107	0.020		D(RETURNCO46(-1))	0.486	0.001
	D(RETURNCO36(-2))	-0.832	0.000		D(RETURNCO46(-2))	0.852	-0.001
co37	D(VOLCO37(-1))	-0.578*	0.001	**co47**	D(VOLCO47(-1))	-0.608*	0.001
	D(VOLCO37(-2))	-0.307*	0.002		D(VOLCO47(-2))	-0.303*	-0.001
	D(RETURNCO37(-1))	-1.907	0.029		D(RETURNCO47(-1))	2.270	-0.106
	D(RETURNCO37(-2))	-1.053	0.002		D(RETURNCO47(-2))	1.619	-0.024
co38	D(VOLCO38(-1))	-0.506*	0.001	**co48**	D(VOLCO48(-1))	-0.544*	0.003
	D(VOLCO38(-2))	-0.239*	-0.001		D(VOLCO48(-2))	-0.285*	0.001
	D(RETURNCO38(-1))	1.803*	-0.020		D(RETURNCO48(-1))	2.416*	-0.023
	D(RETURNCO38(-2))	0.988	-0.045		D(RETURNCO48(-2))	1.648*	0.000
co39	D(VOLCO39(-1))	-0.513*	0.002	**co49**	D(VOLCO49(-1))	-0.475*	0.001
	D(VOLCO39(-2))	-0.276*	0.002		D(VOLCO49(-2))	-0.248*	0.002
	D(RETURNCO39(-1))	1.255	0.010		D(RETURNCO49(-1))	1.158	0.005
	D(RETURNCO39(-2))	0.979	-0.026		D(RETURNCO49(-2))	0.944*	-0.049
co40	D(VOLCO40(-1))	-0.520*	0.000	**co50**	D(VOLCO50(-1))	-0.522*	0.000
	D(VOLCO40(-2))	-0.240*	0.000		D(VOLCO50(-2))	-0.268*	0.001
	D(RETURNCO40(-1))	1.266	0.066		D(RETURNCO50(-1))	-0.746	0.009
	D(RETURNCO40(-2))	0.730	-0.010		D(RETURNCO50(-2))	1.527	-0.051
co41	D(VOLCO41(-1))	-0.618*	-0.001	**co51**	D(VOLCO51(-1))	-0.595*	0.004*
	D(VOLCO41(-2))	-0.299*	-0.001		D(VOLCO51(-2))	-0.296*	0.002
	D(RETURNCO41(-1))	1.038	0.002		D(RETURNCO51(-1))	1.030	-0.110*
	D(RETURNCO41(-2))	1.036	0.042		D(RETURNCO51(-2))	0.867	-0.074*
co42	D(VOLCO42(-1))	-0.547*	0.001	**co52**	D(VOLCO52(-1))	-0.541*	-0.001
	D(VOLCO42(-2))	-0.251*	0.001		D(VOLCO52(-2))	-0.285*	0.000
	D(RETURNCO42(-1))	0.507	-0.052		D(RETURNCO52(-1))	0.600	0.077
	D(RETURNCO42(-2))	-0.014	-0.020		D(RETURNCO52(-2))	0.694	0.038
co43	D(VOLCO43(-1))	-0.528*	0.001	**co53**	D(VOLCO53(-1))	-0.593*	0.000
	D(VOLCO43(-2))	-0.244*	0.002*		D(VOLCO53(-2))	-0.283*	0.000
	D(RETURNCO43(-1))	1.303*	0.023		D(RETURNCO53(-1))	-0.167	0.040
	D(RETURNCO43(-2))	1.440	0.002		D(RETURNCO53(-2))	0.650	0.019
co44	D(VOLCO44(-1))	-0.551*	0.001	**co54**	D(VOLCO54(-1))	-0.593*	0.000
	D(VOLCO44(-2))	-0.233*	0.002		D(VOLCO54(-2))	-0.279*	0.000
	D(RETURNCO44(-1))	0.034	0.149*		D(RETURNCO54(-1))	1.782	0.114*
	D(RETURNCO44(-2))	0.646	0.070*		D(RETURNCO54(-2))	1.440	0.027

*Signeficant (t-statistic ≥ 2.5)

VOT and) !ŊǿøƨǗɛ φøƏƐŊjƳ lƑƓŧƽƗŊj üŊjƐɋƗǁɛ !ɰΘ ǅžĭƓ hŭlĭǅžƑǆžĭɋǁɛ hʊƨűyǁɛ .č

:(VOL

ǅžĂùŏ!ƒ ýĂƒþƙ ǅžηơĂ Ŏ!Ɠơ!ƒ ýĂƒþƙ!ƒ ǅžηơ LJŏɓ Ɨŏŧŏǆž ƓǈŏƥƗ!ƒ Ɨpǚƶ!ƒ ýŏǁơƙ ƽɓʅ Ɠǆžŏ5 ǅžƙ þl!

Ŏùǁŏ Ɠǆžŏ5Ă ÜLJŏƙƧǆž ŊǿơƧT þƓƶŏ Ǚ Ĭƙơ Ŏǁŏ Ɠǆžǆž ŊƑƓǈĂƙʅƒ ǅžƙŏʅ ƗŏǁƵ Ă ÜLJŏǆžĂŏ ýɓp Ɠǆž!Ă ƽɓƓʅ!ƒ

ƽơǚ!ƒ ýĂþη!ƒ Ŏ5 ŎŊj Ɠǆžŧ ǅžŋʅǛƒ þƑƒĂƵ ƘƓɓǁlƙĂ ýĂƒþƙ!ƒ ǅžηơ LJŏɓ Ɨŏŧŏǆž ƓǈŏƥƗ!ƒ Ɨpǚƶǁ! ýŏǁơƙ

.(ē-đ) ǅžpƧ

ƽɓƓʅù!ƒ ǅžĂùŏ!ƒ ǅžŋùʅƊ þƑƒĂƵ ƘƓɓǁlƙĂ Ŏ!Ɠơ!ƒ ǅžĂŏ!ƒ ýĂƒþƙ ǅžηơĂ LJŏɓ Ɨŏŧŏǆž ƓǈŏƥƗ!ƒ Ɨpǚƶ!ƒ -Ɗ
.(VOT-1 and VOL)

Ɨù!Ǚþ ƘƒƦ ýηǛƒ lƧŏƮp Ɨŏŧŏǆž ƓǈŏƥƗ Ɨpǚƶ þηĂŏ Ǚ ŊǈƊ (VEC) ƧƓɓƙƤƒ ƝƑƓƙǈ ƘƧŋƲƊ

Ɨpǚƶ ǁƓǈŊj LJƓŧ ŊǈƒƗŏơ ÜŎ!Ɠơ!ƒ ǅžĂŏ!ƒ ýĂƒþƙ ǅžηơĂ ƽɓƓʅ!ƒ ǅžĂŏ!ƒ þƑƒĂƵ ƘƓɓǁlƙ LJŏɓ ƗŏƑƓƮơɋ

Ɠùŋǈǆž LJƓùŧ Ɨùŏơ ÜƗʅƒƧþ!ƒ ƗǈŏƵ LJǆž %ĎĐ Ŋƙɓʅǈ Ɠǆžɓ ƗŧƧT (čď) Ŏ5 ƗŏƑƓƮơɋ Ɨ!Ǚþ ƘƒƦ

%čđ Ŋƙɓʅùǈ Ɠǆžɓ ƗŧƧT (Ď) Ă ƗɓηĂǆž Ɨpǚƶ þĂηĂ Ĭ!ɋ ƧŏTƙ %Ěđ Ŋƙɓʅǈ Ɠǆžɓ ƗŧƧT (čč)

Ɨùǆžŏp LJĂùŧƙ ƓǆžþǈƵ ƗŏƑƓƮơɋ Ɨ!Ǚþ ƘƒƦ LJĂŧƙ Ɨpǚƶ!ƒ LJƊ Ɨŏơ ÜƗŏɓǁʅ Ɨpǚƶ þĂηĂ Ĭ!ɋ ƧŏTƙ

.(Ď,đ) ĭĂƓʅƙ ĂƊ Ƨɓŧƒ ƗlǁƱǆž!ƒ (t-statistic)

LJŏǆžĂùŏ ýùɓp Ɠǆž ǅžŋʅƊ þƑƒĂƵ ƘƓɓǁlƙĂ Ŏ!Ɠơ!ƒ ǅžĂŏ!ƒ ýĂƒþƙ ǅžηơĂ LJŏɓ Ɨŏŧŏǆž ƓǈŏƥƗ!ƒ Ɨpǚƶ!ƒ -Ɣ
.(VOT -2 and VOL)

Ɨù!Ǚþ ƘƒƦ ýùηǛƒ lƧŏƮp Ɨŏŧŏǆž ƓǈŏƥƗ Ɨpǚƶ þηĂŏ Ǚ ŊǈƊ (VEC) ƧƓɓƙƤƒ ƝƑƓƙǈ ƘƧŋƲƊ

ǁƓùǈŊj LJƓŧ ŊǈƒƗŏơ ÜŎ!Ɠơ!ƒ ǅžĂŏ!ƒ ýĂƒþƙ ǅžηơ ĬǁƵ LJŏǆžĂŏ ýɓp Ɠǆž þƑƒĂƵ ƘƓɓǁlƙ LJŏɓ ƗŏƑƓƮơɋ

ƘùǈƓŧ Ŏƙ!ƒĂ ÜƗʅƒƧþ!ƒ ƗǈŏƵ LJǆž %čđ Ŋƙɓʅǈ Ɠǆžɓ ƘƓŧƧT (Ě) Ŏ5 ƗŏƑƓƮơɋ Ɨ!Ǚþ ƘƒƦ Ɨpǚƶ

LJĂŧƙ ƓǆžþǈƵ ƗŏƑƓƮơɋ Ɨ!Ǚþ ƘƒƦ LJĂŧƙ Ɨpǚƶ!ƒ LJƊ Ɨŏơ ƗɓηĂǆž Ɨpǚƶ þĂηĂ Ĭ!ɋ ƧŏTƙ Ɠŋƶŏǆžη

.(Ď,đ) ĭĂƓʅƙ ĂƊ Ƨɓŧƒ ƗlǁƱǆž!ƒ (t-statistic) Ɨǆžŏp

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[illegible] Medeiros and Doornik (2008) [illegible]

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.(VOL-1 and VOT)

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.(Ď,đ) [illegible] (t-statistic) [illegible]

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.(VOL-2 and VOT)

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.(Ď,đ) [illegible] (t-statistic) [illegible]

βĂùηĂh) Ƚùǂ̈FǴǀ!ƒ ȽǁöβǁǀǀƒȽöưƧƽ!ƒ Ư5Ƨ Ǳkö˥ (Ƚ ÜƘ) ǇöƘƧǀƽ!ƒ Ŏ5 ǱβǀƘ Ǵǆ Ĭǁ̈Ƶ ƒƇǴǇǁĂ

.(ƫhǴ˥!ƒ ýĂƒβk!ƒ ǱηơĂ Ƚö!Ǵơ!ƒ Ǳǌ˥Ǖ̄ƒ βƑƒĂƵ ƘǴǁǁƘ ǇöǁȽöǂǆǴǇöβȽþűƵ

VOT -1) ƫhǴ˥!ƒ ǱĂö!ƒ Ǳǌ˥Ɒ βƑƒĂƵĂ Ŏ!Ǵơ!ƒ ǱĂö!ƒ Ǳǌ˥Ɒ βƑƒĂƵ ǇöǁȽöǂǆǴǇöβ!ƒ Ƚþűƶ!ƒ -Ɯ
.(and VOT

Ƚù!Ǘβ ƘƒƦ ýùηǕ̄ƒ lƧöʈùþ ȽöǂǆǴǇöβ Ƚþűƶ ǁǴǇǋ ǇƊ (VEC) ƧǴhkƤƒ ǋƑǴkǇ ƘƧǌƱƊ

ǊǇƒ Ƚöơ ÜŎ!Ǵơ!ƒ ǱĂǂ̈! Ǳǌ˥Ǖ̄ƒ βƑƒĂƵ ƘǴǁǁƘĂ ƫhǴ˥!ƒ ǱĂǂ̈! Ǳǌ˥Ǖ̄ƒ βƑƒĂƵ ƘǴǁǁƘ ǇöǁȽöƑǴʈơƺ

ȽùǇöƵ Ǳùηơ ǇùǆǇ %đē ǊkǁǀʅùǇ ǴǆǁȽǂƧT (ďč) Ŏ5 ȽöƑǴʈơƺ Ƚ!Ǘβ ƘƒƦ Ƚþűƶ ǁǴǇǋ ǇǴǂ

ǇƊ Ƚùöơ ÜȽöǁǁù˥ ȽöǂǆǴǇöβ Ƚþűƶ βĂηĂ Ĭ!ƺ ƧöTƘ ƘǴǂƧT!ƒ ǇƦǋ yöǆη ƘǇǴǂ Ƚöơ ÜȽ˥ƒƧβ!ƒ

ĭĂǴ˥ùƘ ĂƊ Ƨùǁǂƒ ȽǀǁƱǆ!ƒ (t-statistic) ȽǆöþǇĂǂƘ ǴǆβǇƵ ȽöƑǴʈơƺ Ƚ!Ǘβ ƘƒƦ ǇĂǂƘ Ƚþűƶ!ƒ

.(Ď,đ)

VOT -) ǇöǆĂö ýǁþ Ǵǆ! Ǳǌ˥Ǖ̄ƒ βƑƒĂƵĂ Ŏ!Ǵơ!ƒ ǱĂö!ƒ Ǳǌ˥Ɒ βƑƒĂƵ ǇöǁȽöǂǆǴǇöβ!ƒ Ƚþűƶ!ƒ -ϴ
.(2 and VOT

Ƚù!Ǘβ ƘƒƦ ýùηǕ̄ƒ lƧöʈùþ ȽöǂǆǴǇöβ Ƚþűƶ ǁǴǇǋ ǇƊ (VEC) ƧǴhkƤƒ ǋƑǴkǇ ƘƧǌƱƊ

Ƚùöơ ÜŎ!Ǵơ!ƒ ǱĂǂ̈! Ǳǌ˥Ǖ̄ƒ βƑƒĂƵ ƘǴǁǁƘĂ ǇöǆĂö ýǁþ Ǵǆ! Ǳǌ˥Ǖ̄ƒ βƑƒĂƵ ƘǴǁǁƘ ǇöǁȽöƑǴʈơƺ

ȽùǇöƵ Ǳùηơ Ǉǆ %ďē Ǌkǁ˥Ǉ ǴǆǁȽǂƧT (ĎČ) Ŏ5 ȽöƑǴʈơƺ Ƚ!Ǘβ ƘƒƦ Ƚþűƶ ǁǴǇǋ ǇǴǂ Ǌǆƒ

Ĭù!ƺ ƧöTùƘ Ĭù!ƺ ƧöTƘ %đ Ǌkǁ˥Ǉ Ǵǆǁ lβơĂ ȽǂƧT ƘǴǂƧT!ƒ ǇƦǋ Ǉǆ ƘǇǴǂ Ƚöơ ÜȽ˥ƒƧβ!ƒ

ȽùþűƵ βĂùηĂ Ĭù!ƺ ƧöTùƘ %ěđ Ǌkǁ˥Ǉ ǴǆǁȽǂƧT (čě) Ă ȽöǁǴηöƒ ȽöǂǆǴǇöβ Ƚþűƶ βĂηĂ

ȽùǀǁƱǆ!ƒ (t-statistic) ȽǆöþǇĂǂƘ ǴǆβǇƵ ȽöƑǴʈơƺ Ƚ!Ǘβ ƘƒƦ ǇĂǂƘ Ƚþűƶ!ƒ ǇƊ Ƚöơ ÜȽöǁǴηöƒ

.(Ď,đ) ĭĂǴ˥Ƙ ĂƊ Ƨǁǂƒ

βùƑƒĂƶ!ƒ ƘǴǁǁƘ ǇöǁȽöǂǆǴǇöβ Ƚþűƶ βĂηĂ Ĭ!ƺ ǇƒƧöTö ǇöǀǁǴ˥!ƒ ǇöƧǴhkƤǗ̆ƒ ǇǴƽ ǁ!ƦǁĂ

.Ƨöʈǀ!ƒ ăβǆ!ƒ Ĭǁ̈Ƶ Ƚö!Ǵơ!ƒĂ ȽǀǁǴ˥!ƒ

þĂùηĂƕ) Ɨù༌ǏƑǴǀ!ƒ Ɨù༌ǒþƕ!ƒ Ɨǒư Ƨ5!ƒ ýĂƕp Ǆǩǒȿ (Θ ÜШ) ǇǒƙƧǀ5!ƒ Ŏ5 Ǆþǀƙ Ǵǆ Ĭ༌Ƶ ƒCǴǇƕĂ

.(ƗǀƕǴȿ!ƒ Ǆǌȿ Ǖ̄ƒ þƑƒĂƵ ƘǴƕ༌ǀƙĂ Ɨǒ!Ǵơ!ƒ Ǆǌȿ Ǖ̄ƒ þƑƒĂƵ ƘǴƕ༌ǀƙ Ǉǒƕ Ɨǒǂǒǆ̌Ǵǉǒþ Ɨpű̌Ƶ

Ŏùƙ!ƒ Lu and Lin, (2010) Ɨȿ ƒƧþ ǋƕ ƘCǴ̌η Ǵǆ yǆ ƽ5ƒĂƙƙ ƗǀƕǴȿ!ƒ Ɨηǒƙǉ!ƒ ǇǴ5 ƒɌǌƕĂ

ƘǴùƕ༌ǀƙ!ƒ Ǉǒùƕ Ɨǒǂǒǆ̌Ǵǉǒþ Ɨpű̌Ƶ þĂηĂ Ĭ!ƍ ƘƧǴƬ Ɨǒơ þǉǌ!ƒ Ŏ5 ǐǴƕǆĂƕ ƽĂȿ Ĭ༌Ƶ ƘǒƧηǅ

.ƗǀƕǴȿ!ƒ ƘǴƕ༌ǀƙ!ƒ ýű̌Ƥ Ǉǆ Ɨǒƕǀƙȿǆ!ƒ ƧǴƶȿ Ǖ̄ƒ ƘǴƕ༌ǀƙƕ ƋƕǇƙ!ƒ ǇƗǆǒ ǋǇƒĂ Ɨǒ!Ǵơ!ƒĂ ƗǀƕǴȿ!ƒ

(ē-đ) ǏǉƧ ýĂþŋ!ƒ

(Vector Error Corection Model)

Ǐnjǉ Ǖƒ þƑƒĂƵ ƘǴǜǘlƙĂ ýĂƒþƙ!ƒ Ǐŋơ LJǒǜ ŧǒŧǒǆǅǴǉǒþ!ƒ ŧþǖƶ!ƒ

	Error Correction:	D(VOL)	D(VOT)		Error Correction:	D(VOL)	D(VOT)
co1	D(VOLCO1(-1))	-0.519*	0.000*	**co8**	D(VOLCO8(-1))	-0.565*	0.000
	D(VOLCO1(-2))	-0.208*	0.000		D(VOLCO8(-2))	-0.240*	0.000
	D(VOTCO1(-1))	8.325	-0.030		D(VOTCO8(-1))	-6.074	-0.038
	D(VOTCO1(-2))	4.557	-0.007		D(VOTCO8(-2))	-4.090	-0.019
co2	D(VOLCO2(-1))	-0.541*	0.000	**co9**	D(VOLCO9(-1))	-0.596*	0.000
	D(VOLCO2(-2))	-0.265*	0.000		D(VOLCO9(-2))	-0.324*	0.000
	D(VOTCO2(-1))	-6.552	-0.002		D(VOTCO9(-1))	5.967	0.008
	D(VOTCO2(-2))	-3.328	-0.002		D(VOTCO9(-2))	2.264	0.004
co3	D(VOLCO3(-1))	-0.638*	0.000	**co10**	D(VOLCO10(-1))	-0.523*	-0.001
	D(VOLCO3(-2))	-0.260*	0.000		D(VOLCO10(-2))	-0.284*	0.008
	D(VOTCO3(-1))	0.923	0.000		D(VOTCO10(-1))	0.041	0.003
	D(VOTCO3(-2))	0.122	0.002		D(VOTCO10(-2))	0.004	0.001
co4	D(VOLCO4(-1))	-0.556*	0.000	**co11**	D(VOLCO11(-1))	-0.658*	0.000
	D(VOLCO4(-2))	-0.262*	0.000		D(VOLCO11(-2))	-0.311*	0.000
	D(VOTCO4(-1))	8.469	-0.008		D(VOTCO11(-1))	-0.210	0.001
	D(VOTCO4(-2))	1.517	-0.006		D(VOTCO11(-2))	-2.108	0.000
co5	D(VOLCO5(-1))	-0.372*	0.000	**co12**	D(VOLCO12(-1))	-0.543*	0.000
	D(VOLCO5(-2))	-0.211*	0.000		D(VOLCO12(-2))	-0.265*	0.000
	D(VOTCO5(-1))	-65.070*	-0.857*		D(VOTCO12(-1))	5.330	-0.067
	D(VOTCO5(-2))	-5.264	-0.051		D(VOTCO12(-2))	14.285	-0.042
co6	D(VOLCO6(-1))	-0.618*	0.000	**co13**	D(VOLCO13(-1))	-0.622*	0.000
	D(VOLCO6(-2))	-0.294*	0.000		D(VOLCO13(-2))	-0.250*	0.000
	D(VOTCO6(-1))	-8.611	-0.034		D(VOTCO13(-1))	16.501	-0.129*
	D(VOTCO6(-2))	4.169	-0.005		D(VOTCO13(-2))	56.837	-0.063
co7	D(VOLCO7(-1))	-0.546*	0.000	**co14**	D(VOLCO14(-1))	-0.565*	0.000
	D(VOLCO7(-2))	-0.300*	0.000		D(VOLCO14(-2))	-0.248*	0.000
	D(VOTCO7(-1))	14.799	-0.045		D(VOTCO14(-1))	-4.734	-0.020
	D(VOTCO7(-2))	12.607	-0.003		D(VOTCO14(-2))	-5.386	-0.018

	Error Correction:	D(VOL)	D(VOT)		Error Correction:	D(VOL)	D(VOT)
co15	D(VOLCO15(-1))	-0.522*	0.000	**co25**	D(VOLCO25(-1))	-0.537*	-0.001
	D(VOLCO15(-2))	-0.264*	0.000		D(VOLCO25(-2))	-0.290*	0.000
	D(VOTCO15(-1))	-3.184	-0.023		D(VOTCO25(-1))	-1.698*	-0.004
	D(VOTCO15(-2))	-0.579	-0.011		D(VOTCO25(-2))	-0.545	-0.001
co16	D(VOLCO16(-1))	-0.518*	0.000	**co26**	D(VOLCO26(-1))	-0.550*	0.000
	D(VOLCO16(-2))	-0.285*	0.000		D(VOLCO26(-2))	-0.212*	0.00۰
	D(VOTCO16(-1))	-11.170	-0.069*		D(VOTCO26(-1))	2.482	-0.01۰
	D(VOTCO16(-2))	-0.632	-0.026		D(VOTCO26(-2))	1.569	-0.008
co17	D(VOLCO17(-1))	-0.520*	0.000	**co27**	D(VOLCO27(-1))	-0.575*	0.000
	D(VOLCO17(-2))	-0.296*	0.000		D(VOLCO27(-2))	-0.258*	0.000
	D(VOTCO17(-1))	11.346	-0.199*		D(VOTCO27(-1))	86.313*	-0.164*
	D(VOTCO17(-2))	38.326	-0.078*		D(VOTCO27(-2))	54.120	-0.040
co18	D(VOLCO18(-1))	-0.558*	0.000	**co28**	D(VOLCO28(-1))	-0.451*	0.002
	D(VOLCO18(-2))	-0.263*	0.000		D(VOLCO28(-2))	-0.229*	0.000
	D(VOTCO18(-1))	89.521*	-0.174*		D(VOTCO28(-1))	-10.459	-0.080
	D(VOTCO18(-2))	30.309	-0.098*		D(VOTCO28(-2))	8.750	2.456
co19	D(VOLCO19(-1))	-0.527*	0.000	**co29**	D(VOLCO29(-1))	-0.511*	0.000*
	D(VOLCO19(-2))	-0.199*	0.000		D(VOLCO29(-2))	-0.224*	0.000
	D(VOTCO19(-1))	42.871*	-0.028		D(VOTCO29(-1))	44.093	-0.095*
	D(VOTCO19(-2))	21.950	-0.004		D(VOTCO29(-2))	33.930	-0.021
co20	D(VOLCO20(-1))	-0.568*	0.000*	**co30**	D(VOLCO30(-1))	-0.523*	0.000
	D(VOLCO20(-2))	-0.255*	0.000		D(VOLCO30(-2))	-0.241*	0.000
	D(VOTCO20(-1))	149.632*	-0.236*		D(VOTCO30(-1))	0.822	-0.006
	D(VOTCO20(-2))	121.415*	-0.090		D(VOTCO30(-2))	0.325	-0.003
co21	D(VOLCO21(-1))	-0.578*	0.000	**co31**	D(VOLCO31(-1))	-0.628*	0.000
	D(VOLCO21(-2))	-0.316*	0.001		D(VOLCO31(-2))	-0.303*	0.000
	D(VOTCO21(-1))	0.316	-0.009		D(VOTCO31(-1))	6.231	-0.178*
	D(VOTCO21(-2))	-0.932	-0.004		D(VOTCO31(-2))	47.737	-0.097*
co22	D(VOLCO22(-1))	-0.514*	0.000	**co32**	D(VOLCO32(-1))	-0.504*	0.000
	D(VOLCO22(-2))	-0.217*	0.000		D(VOLCO32(-2))	-0.254*	0.000
	D(VOTCO22(-1))	-20.839	-0.097*		D(VOTCO32(-1))	-63.278	-0.306*
	D(VOTCO22(-2))	-9.996	-0.038		D(VOTCO32(-2))	-3.411	-0.147*
co23	D(VOLCO23(-1))	-0.509*	0.000	**co33**	D(VOLCO33(-1))	-0.436*	0.000*
	D(VOLCO23(-2))	-0.246*	0.000		D(VOLCO33(-2))	-0.232*	0.000
	D(VOTCO23(-1))	-1.046	-0.237*		D(VOTCO33(-1))	-110.747	-0.260*
	D(VOTCO23(-2))	-1.548	-0.109*		D(VOTCO33(-2))	-85.278	-0.133*
co24	D(VOLCO24(-1))	-0.472*	0.000	**co34**	D(VOLCO34(-1))	-0.529*	0.000*
	D(VOLCO24(-2))	-0.262*	0.000		D(VOLCO34(-2))	-0.316*	0.000*
	D(VOTCO24(-1))	-6.550	-0.231*		D(VOTCO34(-1))	35.746	-0.164*
	D(VOTCO24(-2))	3.805	-0.030		D(VOTCO34(-2))	15.005	-0.085*

	Error Correction:	D(VOL)	D(VOT)		Error Correction:	D(VOL)	D(VOT)
co35	D(VOLCO35(-1))	-0.516*	0.000*	**co45**	D(VOLCO45(-1))	-0.505*	0.000
	D(VOLCO35(-2))	-0.242*	0.000		D(VOLCO45(-2))	-0.276*	0.000
	D(VOTCO35(-1))	-1.013	-0.271*		D(VOTCO45(-1))	13.713	-0.021
	D(VOTCO35(-2))	4.321	-0.092*		D(VOTCO45(-2))	-0.277	-0.010
co36	D(VOLCO36(-1))	-0.602*	0.000	**co46**	D(VOLCO46(-1))	-0.518*	0.000
	D(VOLCO36(-2))	-0.292*	0.000		D(VOLCO46(-2))	-0.248*	0.000
	D(VOTCO36(-1))	2.280	-0.002		D(VOTCO46(-1))	45.620*	-0.245*
	D(VOTCO36(-2))	1.415	-0.001		D(VOTCO46(-2))	17.024	-0.085*
co37	D(VOLCO37(-1))	-0.576*	-0.001	**co47**	D(VOLCO47(-1))	-0.400*	0.000
	D(VOLCO37(-2))	-0.308*	0.000		D(VOLCO47(-2))	-0.192*	0.000
	D(VOTCO37(-1))	0.093	-0.002		D(VOTCO47(-1))	-3.216	-0.988*
	D(VOTCO37(-2))	1.078	-0.003		D(VOTCO47(-2))	3.266	-0.403*
co38	D(VOLCO38(-1))	-0.482*	0.000*	**co48**	D(VOLCO48(-1))	-0.529*	0.000
	D(VOLCO38(-2))	-0.229*	0.000		D(VOLCO48(-2))	-0.281*	0.000
	D(VOTCO38(-1))	8.536	-0.178*		D(VOTCO48(-1))	60.534	-0.229*
	D(VOTCO38(-2))	23.895	-0.089*		D(VOTCO48(-2))	50.851*	-0.121*
co39	D(VOLCO39(-1))	-0.516*	0.000	**co49**	D(VOLCO49(-1))	-0.457*	0.000*
	D(VOLCO39(-2))	-0.272*	0.000		D(VOLCO49(-2))	-0.238*	0.000
	D(VOTCO39(-1))	37.242	-0.193*		D(VOTCO49(-1))	-3.823	-0.064
	D(VOTCO39(-2))	22.886	-0.069*		D(VOTCO49(-2))	-3.286	-0.031
co40	D(VOLCO40(-1))	-0.510*	0.000	**co50**	D(VOLCO50(-1))	-0.530*	0.000
	D(VOLCO40(-2))	-0.233*	0.000		D(VOLCO50(-2))	-0.252*	0.000
	D(VOTCO40(-1))	48.790*	-0.135*		D(VOTCO50(-1))	110.491*	-0.206*
	D(VOTCO40(-2))	27.523*	-0.050*		D(VOTCO50(-2))	54.028	-0.117*
co41	D(VOLCO41(-1))	-0.624*	0.000*	**co51**	D(VOLCO51(-1))	-0.590*	0.000*
	D(VOLCO41(-2))	-0.306*	0.000*		D(VOLCO51(-2))	-0.287*	0.000*
	D(VOTCO41(-1))	60.843	-0.163*		D(VOTCO51(-1))	167.612*	-0.248
	D(VOTCO41(-2))	60.524*	-0.036		D(VOTCO51(-2))	69.507*	-0.141*
co42	D(VOLCO42(-1))	-0.470*	0.000*	**co52**	D(VOLCO52(-1))	-0.536*	0.000
	D(VOLCO42(-2))	-0.215*	0.000*		D(VOLCO52(-2))	-0.284*	0.000
	D(VOTCO42(-1))	-115.946*	-0.183*		D(VOTCO52(-1))	-3.653	-0.001
	D(VOTCO42(-2))	-22.507	-0.084*		D(VOTCO52(-2))	-1.298	0.001
co43	D(VOLCO43(-1))	-0.522*	0.000*	**co53**	D(VOLCO53(-1))	-0.595*	0.000
	D(VOLCO43(-2))	-0.234*	0.000*		D(VOLCO53(-2))	-0.276*	0.000
	D(VOTCO43(-1))	107.459*	-0.131*		D(VOTCO53(-1))	151.184*	-0.157*
	D(VOTCO43(-2))	49.526*	-0.068*		D(VOTCO53(-2))	72.937*	-0.081*
co44	D(VOLCO44(-1))	-0.559*	0.000	**co54**	D(VOLCO54(-1))	-0.604*	0.000
	D(VOLCO44(-2))	-0.228*	0.000		D(VOLCO54(-2))	-0.286*	0.000
	D(VOTCO44(-1))	73.433	-0.130*		D(VOTCO54(-1))	118.069*	-0.200*
	D(VOTCO44(-2))	8.363	-0.013		D(VOTCO54(-2))	94.248*	-0.043

*Signeficant (t-statistic ≥ 2.5)

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þĂŋĂ ǁ!ƦǂĂ ÜđĐ ƗƺǴǶ!ƒĂ ƗǙƒƧþ!ƒ ƗǈǒƵ ƘǴǂƧƬ ƴǒǆŋ! ǅǌǙǕƒ þƑƒĂƵĂ ýĂƒþǩ!ƒ ǅŋơ ǇǆǏ

ƗǈǒƵ ƘǴǂƧƬ!ƒ ƴǒǆŋ! ǅǌǙǕƒ þƑƒĂƵ ƘǴǶǁǀǩĂ ýĂƒþǩ!ƒ ǅŋơ ǇǑǶ ýŋǕƒ ƗǁǒĂƱ ýǆǴǂǩ ƗƿǖƵ

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ƗǒþǴơǷ ƗǒǶǶǙ ƗƿǖƵ (Granger Causality) ƗǒǶǶǙ!ƒ ƧǴǶǩƤƒ ýǖƤ ǇǆǏ ƗǙƒƧþ!ƒ Ƙþŋ Ă

ƘǴǂƧƬ ǇǆǏ %ēČ ù! ýĂƒþǩ!ƒ ǅŋơ Ǐ!ǫ ǅǌǙǕƒ þƑƒĂƵ ǇǆǏ ǋŋǩǩ ƗǒƑǴƬơǫ Ɨ!Ǖþ ƘƒƦ ǉǴŋǩǕƒ

ǅŋơ Ă ǅǌǙǕƒ þƑƒĂƵ ƘǴǶǁǀǩ ǇǑǶ ƗǒǶǶǙ!ƒ Ɨƿǖƺǁ! ǴơưƒĂ ǣǂƬ þŋǩ ǅǆ! ǴǌǈǷ Ǖǫ ÜƗǙƒƧþ!ƒ ƗǈǒƵ

ƘǴǶǁǀǩ ǇǆǏ ǋŋǩǩ ƗǒƑǴƬơǫ Ɨ!Ǖþ ƘƒƦ ƗǒǶǶǙ ƗƿǖƵ ǁǴǈǋ ǇǷ ƗǙƒƧþ!ƒ Ƙþŋ Ă ǂǒơ ýĂƒþǩ!ƒ

ƗǒǶǶǙ ƗƿǖƵ þĂŋĂĂ ÜƗǙƒƧþ!ƒ ƘǴǂƧƬ ƳĂǆŋǆ ǇǆǏ %ĐĐ ǊǩǶǙǈ ǴǆƵ! ýĂƒþǩ!ƒ ǅŋơ Ǐ!ǫ þƑƒĂƶ!ƒ

ƳĂǆŋǆ ǇǆǏ %ĎČ ǊǩǶǙǈ ǴǆƵ! þƑƒĂƶ!ƒ ƘǴǶǁǀǩ Ǐ!ǫ ýĂƒþǩ!ƒ ǅŋơ ǇǆǏ ǋŋǩǩ ƗǒƑǴƬơǫ Ɨ!Ǖþ ƘƒƦ

.ƗǙƒƧþ!ƒ ƗǈǒƵ ƘǴǂƧƬ

ƘƒƦ ýŋǕƒ ƧǒƬƿ ƗǒǂǒǆǴǈǒþ ƗƿǖƵ þĂŋĂ ǣǒ!þ (VEC) ƧǴǶǩƤƒ ýǖƤ ǇǆǏ ƗǙƒƧþ!ƒ Ƙþŋ Ă

ǂǒơ ƗǈǒƶƵ!ƒ ƘǴǂƧƬ ƴǒǆŋ! ȿǶǴǙ!ƒ ýĂƒþǩ!ƒ ǅŋơĂ Ǒ!Ǵơ!ƒ ýĂƒþǩ!ƒ ǅŋơ ǇǑǶ ƗǒƑǴƬơǫ Ɨ!Ǖþ

þĂŋĂ Ǐ!ǫ ƗƼǴưǗǴǶ ÜǑǶǶǀǩǙǆƵ!ƒ ýĂƒþǩ!ƒ ǅŋơǶ ȿǶǴǙ!ƒ ýĂƒþǩ!ƒ ǅŋơ ýǖƤ ǇǆǏ ƌǶǈǩ!ƒ ǇǂǆǒǑ

Ɨǒ!Ǵơ!ƒĂ ƗǁǶǴǙ!ƒ ǅǌǙǕƒ þƑƒĂƵ ƘǴǶǁǀǩ ǇǑǶ ƗǒƑǴƬơǫ Ɨ!Ǖþ ƘƒƦ ýŋǕƒ ǀƧǒƬƿ ƗǒǂǒǆǴǈǒþ ƗƿǖƵ

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ǣǂ ǇǑǶ ýŋǕƒ ǀƧǒƬƿ ƗǒǂǒǆǴǈǒþ ƗƿǖƵ þĂŋĂ! ƗǒƑǴƬơǫ Ɨ!Ǖþ ƘƒƦ ǊƑǴǩǈ þŋǩ ǅǆ! ǴǌǈǷ Ǖǫ

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Kalbani (2005)

Tudor and Miron

(NASDAQ) ƗƮƧǍƅ ǏǁƵ ƘǒƧƞ Ǒķ!ƒǍ Chiang et al, (ĎČČĕ) ƗƪƒƧƥ ƝǒǃǤ ƘƮǁƤ

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ǏǁƵ ƘǒƧƞ Ǒķ!ƒǍ Darwish (ĎČčč) ƗƪƒƧƥ ƝǒǃǤ ƘƮǁƤ Ɠǆ ƴǆ ƯƿƓǇķķ ƓǌǇǅ ǛǤ

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ƽǍƪ ǏǁƵ ƘǒƧƞ Ǒķ!ƒǍ Abu Hassan and Cheong (ĎČČē) ƗƪƒƧƥ ƝƑƓķǇ ƴǆ ƯƿƓǇķķ

Ɨǒƅƅƪ ƗƿǚƵ ǁƓǇǋ Ǉƒ Ǐ!Ǥ ƘƮǁƤ Ǒķ!ƒǍ ƓǒƨǒƓǆ Ǒ5 Ɨǒ!Ɠǆ!ƒ ƽƒƧǍǖ! (Kuala Lampur)

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ƊǇ- ǑǁƅǀķƪǆǇ!ƒ ýǍƒƥķ!ƒ ǅƞơ ǅ!ƓƶǆǍ ƥǒƥơķ! ƽƅƓƪ!ƒ ýǍƒƥķ!ƒ ǏǁƵ ƥƓǆķƶǛƒ ǇǒƧǆǍķƪǆǁ! ǇƗǆǒ

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Ɣ- ƥǜƑƒǍƵ ƘƓǜƅǁǀķƅ ơƅǇķǁ! ƗǀƅƓƪ!ƒ ǅǌƪǛƒ ƥƑƒǍƵ ƘƓƅǁǀķ ǏǁƵ ƥƓǆķƶǛƒ ǇǒƧǆǍķƪǆǁ! ǇƗǆǒ ƓǆƗ

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Ƙ- ǏǁƵ ƧƓƶƪǛƒ ƧǒƺǇ! ƧƮơǆƗ ýǍƒƥķ!ƒ ǅƞơ ǏǁƵ ǇƓǆƵ ƗƮƧǍƅ Ǒ5 ǇǒƧǆǍķƪǆ!ƒ ƥƓǆķƵƒ ǅƥƵ

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Ɨ- ǅƥƵ ƥƓǆķƵƒ ǇǒƧǆǍķƪǆ!ƒ ǏǁƵ ƥƑƒǍƶ!ƒ ƘƓƅǁǀķƅ ơƅǇķǁ! ƗǀƅƓƪ!ƒ ǅǌƪǛƒ ƗǒǁƅǀƪǆǇ!ƒ ǏǁƵ ǎƥǜǆ!ƒ

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ƻ ƮǈǃƒĂ ĎČČđ-ĎČČĐ ǇǑǆǅƸǃƒ ýǘƤ ǇǅǆƸ ƗƮƧĂƕ ǂƒƥƉ .ǆĎČČĒ . ǐ ƧƕƮ ÜƔǒƱƤǃƒ

ƘǅƪƒƧƥǃƒ ƪƧƒƥǫ ÜƗǒǃĂƥǃƒ ƘǅǒƿƧƀŬƒĂ ƘǅƪƒƧƥǃƒ ǈƥơĂ .ĎČČĒ/ĎČČđ ǇǑǆǅƸǃƒ ǇƸǆ ýĂǅǃƒ

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Al-Dwairi, Khaled M. Fandi. The Dynamic Relationships between Trading Volume, Stock Returns, and Volatility: Evidence from Amman Stock Exchange. Master thesis, Yarmouk University (2013). (Supervisor: D. Dima Al-Rabadi)

The main objective of this study is to investigate the dynamic relationship between trading volume, stock retune and volatility, using daily data for the period between 1/1/2002 to 31/12/2011, for 54 listed firms in Amman stock Exchange (ASE).
In order to achieve the study objective, three test have been used, first this study used Johansen Cointegration test to investigate the Long run Cointegration relationship between the study variables, Granger Causality test has been used to find out if there is an causal relationship between trading volumes, stock retune and volatility. Finley, Vector Error Correction Model (VEC) has been used to test the short run dynamic relationship between variables.

The result of the Johansen Cointegration test provide an evidence about the existents of long run Cointegration relationship between trading volume, stock retune for all firms in the study sample، and long run Cointegration relationship between trading volume and volatility for 90% of firms in the study sample. The result of Granger Causality test shows that there is a significant negative Unit-Directional relationship between stock retune and trading volumes for 70% of study sample, but for the causality relation between trading volume and the volatility of stock retune the relation still ambiguous.

The study found significant negative short run dynamic relationship between contemporaneous trading volume and previous trading volume for all firms in the study sample. In addition there is a significant

positive short run dynamic relationship between contemporaneous return volatility and previous return volatility for 57% of firm’s sample.

In the other hand the study found no significant dynamic relationship in the short-run between each of the contemporaneous trading volume and previous stock return and between the contemporaneous stock return and previous trading volume, the study doesn’t found any evidences that support the assumption about the existents of short run dynamic relationship between contemporaneous stock return and previous stock returns and between the previous trading volume and contemporaneous return volatility and between previous return volatility and contemporaneous trading volume.

Keywords: Amman Stock Exchange, Volume, Return, Volatilty, Cointegration, Granger, VEC.